Engineering Library

WARM AIR HEATER SPECIAL

JAN 5 1922

AMERICAN ARTISAN and Hardware Record

Vol. 82. No. 27. 620 SOUTH MICHIGAN AVENUE, CHICAGO, DECEMBER 31, 1921. $2.00 Per Year.

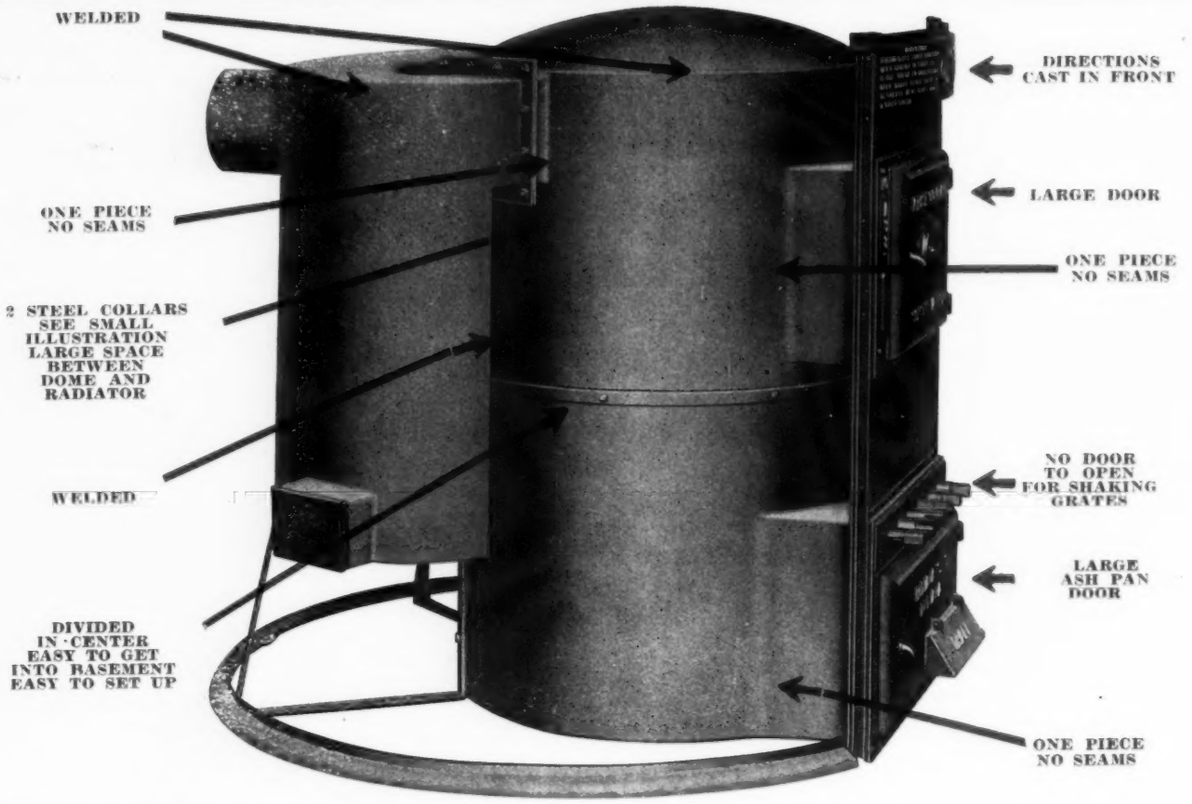
A HAPPY NEW YEAR

ARMCO-Middletown, Ohio

Published weekly, entered as Second-Class Matter June 25, 1885 at the Post Office at Chicago, Illinois, under Act of March 3rd, 1879

ALPHABETICAL INDEX AND CLASSIFIED LIST OF ADVERTISERS, Pages 137 to 139

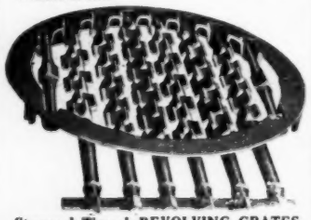
KRUSE *Welded Steel Furnaces*


WELDED
ONE PIECE NO SEAMS
2 STEEL COLLARS SEE SMALL ILLUSTRATION LARGE SPACE BETWEEN DOME AND RADIATOR
WELDED
DIVIDED IN CENTER EASY TO GET INTO BASEMENT EASY TO SET UP
DIRECTIONS CAST IN FRONT
LARGE DOOR
ONE PIECE NO SEAMS
NO DOOR TO OPEN FOR SHAKING GRATES
LARGE ASH PAN DOOR
ONE PIECE NO SEAMS

You've always wanted to sell a Perfectly Balanced Furnace

LONG FIRE TRAVEL RADIATOR

Special attention is called to the large size which gives extra length to smoke travel and greater radiating surface. No lost heat. Large space between combustion chamber and radiator allows free flow of large volume of air.



Staggard Thread REVOLVING GRATES

The bars are extra heavy and turn independably of the others. Their patented design makes shaking easier and more efficient. They can be left in any position without fear of burning or loss of coal.

HERE it is. Look it over—see how its every point of construction is a feature.

That's what makes the KRUSE Welded Steel a *perfectly balanced furnace*—a real warm air heater and a saver of fuel.

The grate area, fire box, radiator and combustion chamber all harmonize in design and relate in size, so that all the heating value is obtained from the fuel.

Every seam of the KRUSE steel furnace is welded, making them as durable as the body metal—no lapped joints, no inside exposed edges. The fire brick used for the fire box lining is of extra height—the galvanized steel casing is large and doubled at the fire box and combustion chamber—the vapor pan is large and placed so that all the air is properly humidified.

There are other features too and you will find the KRUSE the easiest and quickest furnace to install because of its simplicity and perfect fitting parts.

Our consulting department is always ready to solve your heating problems and to help you sell the KRUSE Welded Steel furnace.

Start now to sell the KRUSE *perfectly balanced* furnace—the heater with over 50 years of practical experience behind it.

Drop a line today for full particulars, circulars, prices and agency details.

KRUSE COMPANY, *Furnace Manufacturers*
353 W. 16th Street Place, INDIANAPOLIS, IND.

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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WARM AIR HEATING MADE PROGRESS DURING 1921.

It is with much gratification that we are able to state that 1921 has witnessed considerable progress in the warm air heating field, in spite of the adverse business conditions.

The method of heating homes with warm air is gaining a stronger foothold among those who are building homes for their own use, because people are coming to realize that besides the lower first cost of installation, which is undisputable, the warm air furnace means less expense in upkeep, in maintenance and in fuel, and also that a properly installed warm air furnace of the right size actually delivers the goods—from the standpoint of heating as well as from that of ventilation—something which no other kind of heating apparatus will do.

Those engaged in this important field have reason to look back upon 1921 with much gratification, because a number of specific steps have been taken to insure a continued march of progress.

We may soon expect to have a real code for installation—a code which can really be enforced because it will appeal in its formulas and directions to manufacturers, installers and house owners alike.

Before long we shall also have reached the point where warm air furnaces will be rated upon actual performance rather than by the over-enthusiastic imagination of some individual, who may be honest enough in his belief but who has no real facts upon which to base his claims.

Simply as a matter of statistics, we are pleased to call attention to the fact that our 1921 Warm Air Heater Special contains more advertisements than any one of its predecessors and far more than any other similar publication has ever carried, pertaining to warm air furnaces and supplies. It is gratifying to know that the progressive manufacturers and wholesale distributors recognize that American Artisan and Hardware Record is the leading advertising medium in this field, and it inspires us to keep up in our work toward the continued progress of the warm air heating industry.

Your special attention is invited to the many excellent articles on important matters of interest to the trade which will be found in editorial and news sections. To those who have contributed so freely of their time and thought toward the success of the 1921 Warm Air Heater Special we extend our sincere appreciation.

It is interesting to note in this connection that much attention is being given to this matter of providing inexpensive heating plants for large buildings, such as warehouses, shops, garages, exhibition halls, churches, etc., and that in numerous instances, warm air furnaces with fan blower attachments have been found highly efficient.

A large field is thus opened up, and it behooves the installer to be on the lookout for all such opportunities for increasing his field of work.

When we consider the fact that there exists a shortage of over a million residence buildings, and that building costs have now been reduced to a point where it is financially practical to invest money in a home, we have every reason to look forward to a heavy business in warm air furnaces, during the next few years.

Random Notes and Sketches

By Sidney Arnold

My friend, Bert J. Hawkins, hardware dealer and prominent in the affairs of the Chicago Retail Hardware Association, sends me this for a laugh:

The fact that his supposedly adored big brother was returning home from college that day had been carefully concealed from ten-year-old Tommy until he came back from school.

"Tommy," said his mother, after her younger son had gone upstairs to wash his face and the elder had been concealed in the pantry, "I have a big surprise for you."

"I know what it is," replied Tommy unconcernedly. "Brother's back."

"Why, how did you guess that?"

"'Cause my bank won't rattle any more.'

* * *

August Luedke, Secretary and Assistant Treasurer Milwaukee Corrugating Company, Milwaukee, Wisconsin, states that the following incident has no connection with any of his Company's salesmen. They are noted for their cleverness in such situations:

She—He bored me awfully, but I don't think I showed it. Every time I yawned I hid it with my hand.

He (trying to be gallant)—Really, I don't see how so small a hand could hide—er, that is, isn't it lovely weather?

* * *

We were talking about comical blunders of expression, and the following clipping from a country newspaper was submitted by my friend, Ed H. Hoffield, vice-president and general manager, Ferdinand Dieckmann Company, Cincinnati, Ohio:

"Born to Mr. and Mrs. Walter F. Schultz, a baby boy on August 22nd, at Gotha Thurigen, Germany. Word of this news was received here last week by his parents."

* * *

I am indebted to Al Friedley of Friedley-Voshardt Company, Chicago, Illinois, for the appended story:

"Have you heard of Taylor's luck?" enquired Jones.

"No, what was it?"

"He was operated on for the removal of a pearl which he had accidentally swallowed while eating oysters at one of the New England beaches, and when the pearl was examined it was found to be valuable enough to pay for both the operation and the funeral."

* * *

Few persons enjoy puns more than does my friend Irving S. Kemp of the Vaughan & Bushnell Manufacturing Company, Chicago, Illinois. Here is one which he passed on to me:

"I say," remarked a man, who was very slim, to a friend. "I met Fuller yesterday, and he told me I was getting fatter."

"Well, it's only natural he should say so," was his friend's reply.

The slim man looked surprised, and asked why.

"That's easy," replied the friend. "You were looking Fuller in the face!"

Only by the most persistent patience is it possible to train the average youngster to use correct grammar, declares my friend, H. E. Marsh, manager of sales, Marsh Lumber Company, Dover, Ohio.

As exemplifying the difficulties, he tells this story:

Little Marie's school teacher uncle met her on the street and asked her if she were going to the picnic.

"No, I ain't," she replied.

"My dear," said the horrified pedant, "You should not say ain't. You must say, 'I am not going,'" and he proceeded to give her a little lesson in grammar.

"I am not going. You are not going. He is not going. We are not going. They are not going. Now can you say all that, Marie?"

"Sure," answered Marie with confidence. "There ain't nobody going."

* * *

W. A. Denny of Hampton, Missouri, ex-president Missouri Retail Hardware Association, relates the blunder of a bashful man:

Bashful Mr. Jones was at a dinner party and had been trying all evening to say something nice to his hostess.

Finally he thought he saw his chance.

"What a small appetite you have, Mr. Jones," she remarked.

"To sit next to you, Mrs. Smith," he replied gallantly, "would cause any man to lose his appetite."

And then he wondered why he wasn't invited to the next affair.

* * *

Probably the greatest of all virtues is intellectual honesty, in the opinion of my friend, W. L. Seelbach, treasurer of the Walworth Run Foundry Company, Cleveland, Ohio.

To tell the whole truth in such a way as to leave no false inference is not always done, he says—for instance, in the following case:

Investor—What do you mean by falsely representing the property? The notice stated that there was a view of fifty miles, and I couldn't see fifty yards.

Agent—No deception at all, sir. Which way did you look?

Investor—Well, I looked all round me, and I could not see out of the valley.

"Well, mister," returned the agent, "you didn't look right. If you had gazed up, there'd have been no trouble. I suppose you can see mor'n fifty miles up.

"I tell you, mister," he added, as the investor walked off, "we don't misrepresent the facts down here."

* * *

The Girl Who Laughs.

The girl who laughs—men love her;
She lifts from the heart of despair
Its burden of woe
And coaxes a glow
Of joy to the brow of care.

The girl who laughs when sorrow
Comes by, and a glistening tear
Has stolen the glints
Of rainbow tints
And pictured a word of cheer.

The girl who laughs—life needs her:
There is never an hour so sad
But wakes and thrills
To the rippling trills
Of the laugh of a lass who's glad.

Up-to-the-Minute News Siftings

Items of Interest to Dealers Gleaned from Many Fields. National and Local Business Plans, Problems and Practices.

PENNSYLVANIA STOVE SALESMEN HOLD BIG RECEPTION

It was just twenty-four years ago that the Stove Salesmen's Association of Pennsylvania was organized with a handful of members on North Second Street in Philadelphia and has with each succeeding year increased its membership. It was incorporated in 1906 under the laws of Pennsylvania and its membership numbers in excess of 100.

The spirit that always prevails at the annual reception and banquet of the Stove Salesmen was lived up

Frank S. Hawken, Retiring President, Stove Salesmen's Association of Pennsylvania.

to in this year's gathering, December 21st, in Hotel Walton, Philadelphia, Pennsylvania.

Bill Abbott seemed to be the boss of things and made the members toe the mark. This was especially true when a few of the members were playing poker. He told them when to stop—and they stopped when he told them.

President Frank S. Hawken made a short address to the members and expressed the desire, which was approved by all the members present, to make the Association national.

It would be a good step toward progress in a get-to-gether convention or reception of all the salesmen of the country.

At this meeting the views and opinions of the salesmen could be discussed, and to explain this national meeting of salesmen "the right hand would know what the left hand was doing," both in a commercial and social way.

Other matters of importance were passed upon unanimously by the members. The meeting was called to order and the members and their guests adjourned to the Japanese Banquet Hall which was beautifully decorated.

Officers for the ensuing term were elected, as follows:

President: HARRY E. BORZELL.
First Vice-president: H. J. FUELLER.
Second Vice-president: WILLIAM H. YOUNG.
Third Vice-president: JAMES BLACK.
Secretary: JAMES MCGAW.
Treasurer: O. M. FAGLEY.
Trustees: JAMES R. WOTHERSPOON, J. B. BORDEN, and GEORGE WAGONER.

The retiring president, Frank S. Hawken, requested all present to rise and sing America. Everyone seemed to be patriotic.

Menu.

Hearts of Celery
Queen Olives
Grape Fruit Oriental
Cream of Tomatoes Favorite
Filet of Sole Dieppoise
Parsley Potatoes
Half Squab Chicken
Roasted and Stuffed
Rissole Sweet Potato
Small Peas in Cream
Fancy Ice Cream Assorted Cakes
Demitasse
Cigars Cigarettes

Toasts.

Selected

Toastmaster
Mr. Frank S. Hawken.

The officers-elect to serve for the coming year were inducted into office upon the conclusion of the toasts.

The gathering was favored as usual with a fine musical program.

Needless to say the newly-elected president was called upon to make a speech, and it is worthy to note here that Harry E. Borzell was elected the first president of the Stove Salesmen's Association just twenty-four years ago and that he is to take the reins again and conduct the welfare of the Association. The ovation accorded Mr. Borzell was received with no little pride.

James McGaw was re-elected secretary and it is with the Association at heart that he continues his arduous duties in that office. It is a peculiar thing in regard to a secretary of an organization, because it falls on the secretary to accomplish all the work of the various officers and committees, and the position of a secretary is not appreciated.

W. C. White, eastern representative of AMERICAN ARTISAN AND HARDWARE RECORD, was called upon by the toastmaster to say a few words.

The toastmaster, Mr. Hawken, introduced Mr. White as representative of AMERICAN ARTISAN AND HARDWARE RECORD, published by the estate of the

late Daniel Stern, who, he said, was in every way helpful to the stove salesmen, who attended all their meetings, boosted them editorially, and who always kept a warm spot in his heart for them. It was with keen regret of every member of the Stove Salesmen's Association of Pennsylvania that the friendly figure of Daniel Stern was missing from this year's reception. Mr. White acknowledged with sincere appreciation the very high compliments paid the late Mr. Stern and assured the toastmaster and the members of the Association that the spirit of friendliness and helpfulness which Mr. Stern always manifested toward the Stove Salesmen's Association was still alive and warm and active in the staff of AMERICAN ARTISAN AND HARDWARE RECORD.

Mr. White took advantage of the occasion to wish all the members and their guests a cheerful and happy Christmas and a prosperous New Year.

James McGaw, Re-elected Secretary, Stove Salesmen's Association of Pennsylvania.

Without waiting to be called upon, Mr. J. W. Abbott took the floor and devoted his speech to the late publisher of AMERICAN ARTISAN AND HARDWARE RECORD, Daniel Stern. He went on to say that he knew Mr. Stern for thirty-five years or more and knew him to be a man's man who was always willing to exert his every effort to fulfill the wish of the stove and furnace manufacturers and their salesmen.

He received the applause of all present and it was a pleasure to feel that a man could for so many years keep the friendship and confidence of so many.

Mr. Wotherspoon was called upon to say a few words, especially of the trip he and his family had taken to Scotland. He explained that after his absence of thirty-seven years, he remembered the "little gate" which led to his house when he was a boy, and told with much pride, that that same gate was there, also after telling his name to the present occupants of the house in which he lived when a boy, they remembered him.

Mr. Wotherspoon was followed by others, including Mr. O. M. Fagley, Jim Withern, Cuyler Rees, Jim Black, and others.

The retiring president, Mr. Hawken, closed the speech making, saying that after a two-year term as the president of Stove Salesmen's Association he was proud of the honor and did his duty while in office, in spite of two years of depression, to carry on the affairs of the Association, and to promote the feeling and friendship of all the members.

The entertainment committee presented a more than attractive bill and it was enjoyed by all. Ask Bill Abbott how he lost his watch.

The salesmen of Richardson & Boynton Company distributed souvenir thermometers to all the guests with the compliments of the company.

Pittston Stove Company Issues Attractive Catalog.

Clean-cut illustrations which give an accurate idea of its products are a helpful feature of Catalog No. 21 issued by the Pittston Stove Company, Pittston, Pennsylvania.

The explanatory text, while brief, is sufficient for the purpose, especially in view of the excellent general description of the Pittston ranges given in the preface to the catalog.

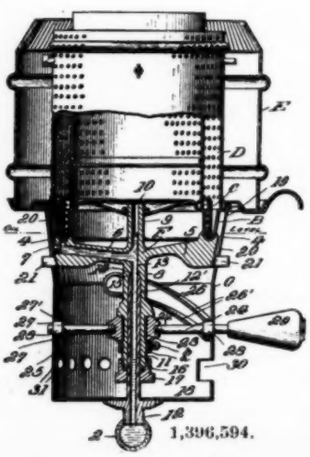
Opens Office as Mechanical and Efficiency Engineer.

After five years with one of the largest stove manufacturers in the United States as their expert, W. L. Mersfelder has opened an office at 306 East Fourth Street, Cincinnati, Ohio, as mechanical and efficiency engineer.

Mr. Mersfelder will devote his time to improvements in the stove and warm air heater lines.

Patent Rights Are Granted for Oil Burner.

Under number 1,396,594, Henry Ruppel, Cleveland, Ohio, assignor to American Stove Company, St. Louis, Missouri, a Corporation of New Jersey, has obtained United States patent rights for a blue flame oil burner described herewith:



In a burner of the type described, a vertically movable trough, an inwardly extending member at its bottom communicating with the trough, the said inward members having an elongated depending sleeve, an oil feeding pipe, a tube extending from the oil feeding piper and fitting within the sleeve, the adjacent surfaces of the sleeve and tube being machine finished, for the purpose described.

Out in Minnesota the Hardware Retailers Are Not Afraid of Mail Order Competition from Any Angle.

Working with the University of Minnesota and Their State Retail Hardware Association, They Are Serving the Community.

The hardware dealer in rural districts is often handicapped by mail order competition.

Sometimes he wages a losing fight against the mail order houses and retires a disgruntled bankrupt.

There is a sure way for him to hold his own in this form of competition and it is by devoting himself to the study and practice of community service.

Judge Frank T. Wilson, Community Adviser for the University of Minnesota, General Extension Service, shows how the dealer can become a power in his district and win prosperity as well.

A good store performs the very essential community service of distributing farm and shop products to the home, he says.

Continuing, Judge Wilson declares that each farm home is vitally concerned in the way in which this service is performed. If enmity prevails instead of friendship, ill will instead of good will, and dissension instead of unity, the community is the loser.

The merchant's big community service is so to conduct his business as to create the best of feeling and good will between himself and his partner, the farmer.

Unfortunately the two partners are too often not on good terms with each other. The farmer thinks the merchant is greedy; that he appropriates an undue profit. The farmer is suspicious, discontented and resentful.

A barrier exists between town and the country. The farmer trades with the mail order house. The merchant only makes a bad matter worse by up-braiding the farmer for lack of loyalty and charging him with ingratitude. The outside competitor is disparaged.

The teacher of agriculture, the county agent and the farm club are condemned as agents for outside trade, when, as a matter of fact, the real worker for the mail order house is too often the country merchant himself.

His lack of tact, his failure to adopt modern methods, and the general spirit manifested toward his customers repels trade and benefits the outside competitor.

The country merchant does not realize that science has transformed farming and that education has made of the farmer an intelligent, progressive business man.

He stands on his rights. He is no longer submissive. He is not willing to take what his trading partner in the community chooses to give him.

But the farmer fails to recognize the fact that two wrongs will never correct each other. In the long run the farmer only hurts himself, if by his trade he builds up the distant town rather than his own home town.

Keep constantly in mind that cooperation rather than competition is the order of the new day.

There is a great and universal truth in the saying of Shakespeare that, "Nothing is good or bad, but thinking makes it so."

Thinking has made our present civilization. Thinking, which is another expression for study, has developed the marvels of electricity and scores of other modern conveniences.

Thinking has evolved modern commerce and merchandising. Thinking can and will improve it.

The retailer, therefore, who studies, who is constantly on the alert for the betterment of his business, for new methods, for more intelligent service, and for personal progress is certain to win prosperity no matter what the odds against him may be.

The public need have no fear of a combination to force up prices. The merchant is like the small boy in Riley's poem: If he doesn't watch out the goblins will get him. The goblin of the country merchant is the mail order house, the chain store or the cooperative store.

Prices can not be forced up. Every farm home has a mail order catalog. It is the authority on prices. Every merchant should also have the mail order catalog on his counter. His farmer friends should be invited to make use of the catalog and then give his merchant friend the first opportunity to make prices.

After all it is only a matter of friendship and prices to build up home trade. Friendship is a matter of acquaintance and understanding.

Community service furnishes the opportunity. If the merchant works with the farmer to promote his special interests it will inevitably make the farmer work with the merchant to advance his special interest, home trade, provided the local merchant has learned the better methods of merchandising.

Building up home trade is simply a matter of improved merchandising. The country merchant must adopt the practices and policies of the successful mail order houses, department stores and chain stores of the big city.

This is especially true as to buying, advertising and service. His slogan must be "A Satisfied Customer." Satisfaction is the fruit of good service.

Yet a chain is only as strong as its weakest link. The store service of a community is the sum total of all the stores. An unprogressive merchant can neu-

tralize the best efforts of the most progressive merchant.

One of the big jobs of community service is to know just what kind of a store service is furnished by the merchants. No individual or group can do this without giving offense. But the community as a whole can do it through its duly authorized representatives.

The store team can make or cause to be made a survey of all the stores of the town. It is a comparatively simple procedure to score each store as exhibits are scored at the county or state fair.

The community has a right to know its kind of stores. Do they belong in the blue, red or white ribbon class? In other words, are they first, second or third class stores? It is of as much concern to get all stores into the first class as it is to get farms equipped with pure-bred live stock, to rotate crops, or to keep up soil fertility.

The procedure is the same. Arouse public sentiment. Encourage study of better ways and methods.

Just as the successful farmer at the farm club meetings tells his neighbor the secrets of his success, so let the successful merchant at the community meetings explain to his neighbors, both merchant and customer, the secrets of his success.

Just as agricultural experts appear at local short courses and institutes for the forum, let the commercial expert appear at local merchandising short courses and institutes for the merchant.

Just as the farmer's boy is encouraged to attend short courses at the farm school or college of agriculture at the university, so encourage the merchant's boy or clerk to attend the university short courses, or School of Commerce.

Just as an agricultural press service at the farm school furnish information of value to the country press for the farmer, so let a merchandising service furnish information of value to the country press for the merchant and the community.

Let the service educate the country merchant to know the soundness of the Scriptural injunction—"Do not hide your light under a bushel." If there is any good reason why people should buy goods at the merchants store he should let the public know. All good reasons are based on quality, price and service.

Advertising in local papers, window displays, goods priced and effectively arranged on shelf and counter are all means by which the public learns to know reasons for home trade.

The store team can serve another purpose of immeasurable value, the enlightenment of the public.

Nine-tenths of all home trade difficulties are due to the ignorance of the public of what is involved in the distribution of products to the home.

Ignorance breeds suspicion and distrust. The University Community Service includes special attention to the service of enlightenment. The effectiveness of this special service will depend upon the zeal with which the country merchant joins the community service, and works with his partner in the country.

It is absolutely essential to keep in mind the distinction of work with and not for each other.

It is a part of the community service to change the ways of the backward merchant or put him out of business. How?

Not by a black list, but by a white list. The educational team of the community service should keep before the community a white list of the merchants who have adopted up-to-date methods.

This white list should be placed in a conspicuous place. The merchants who constitute this list should be commended to the favorable consideration of the community.

The score card is the thing for both farm and store. Let the community service find out how many stores are entitled to a blue ribbon; how many rate only as second class and win a red ribbon; finally, how many are to be put in the third class and are entitled to a white ribbon. It may be well to know how many stores in the community are simply common scrubs.

Friendship grows in common service. Comradeship between soldiers illustrates the friendship which comes when men serve with each other. So let the country merchant win good will by not only zealous merchandising service, but by active community service.

Is Named to Represent American Tack Manufacturers.

H. S. Schroeder of 52 Vanderbilt Avenue, New York City, has been named new national councillor to represent the American Tack Manufacturers' Association in the Chamber of Commerce of the United States.

The National Council of the Chamber of Commerce of the United States consists of one representative each from the more than fourteen hundred commercial and industrial organizations making up the National Chamber's membership. It serves as an advisory body to the National Chamber's Board of Directors.

The Council holds a special meeting preceding the annual convention of the National Chamber to pass on the program and to select a nominating committee. The councillors also act as chairmen of the delegations representing their organizations.

A councillor occupies a position of liaison officer between the National Chamber and his own organization on important questions.

The Chamber of Commerce of the United States is the strongest commercial organization in the world. Its object is to encourage trade and commerce; increase the efficiency of American business organizations; to obtain uniformity and equity in business usages and laws and to get proper consideration and consideration of opinion on questions affecting the financial, commercial, civic, and industrial interests of the country at large.

A system of referenda operated by the Chamber has met with unusual success in obtaining the point of view of business men on national questions. These opinions, when they point to the need of legislation or other governmental action, are transmitted to the government's executive officers and to Congress by the National Chamber's headquarters at Washington.

Good Ideas for Window Display

Practical Lessons from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition. How to Get More Passers-By to Come into Your Store.

USES SINGLE BRAND OF PAINT FOR WINDOW DISPLAY.

It is much easier to travel over a well paved highway than to be compelled to blaze a trail across a trackless country.

In the matter of merchandising paints the broad highway has been thoroughly paved and all the steep hills leveled and graded for easy going by a special, nation-wide publicity campaign known as "save the surface campaign."

Community associations, neighborhood societies, civic bodies of all descriptions have been actively enlisted in the movement for cleaning up and painting up in practically every city, village, and hamlet of the United States.

The people have been prepared by this intensive publicity to buy paints and varnishes with the least amount of resistance to the persuasions of salesmanship. The hardest part of the work, therefore, of paving the way to sales has been done in advance.

The hardware retailer could not achieve the same results with reference to his own customers and prospective patrons by the expenditure of much money and extensive advertising in his territory.

The state of mind created by the national campaign might be said to be a sort of mental synthesis by which community spirit is quickened into a pride of cleanliness and artistry.

Thus, the people are fully prepared to respond to a full extent of their needs to the appeal of window displays of paints and painting supplies.

One of the widely known brands of paint is shown in the accompanying window exhibit, designed and arranged by E. A. Saur, 1410 Yale Place, Minneapolis, Minnesota.

As described by Mr. Saur, this window display had a background built up of the manufacturer's cut-out signs and cheese cloth.

The attention of the passers-by was attracted by a phonograph in the center of the display built with small cans of Jap-a-Lac, and sample boards of Jap-a-Lac grained paper.

Window Display of Single Brand of Paint, Arranged and Designed by E. A. Saur, 1410 Yale Place, Minneapolis, Minnesota.

The horn of the phonograph was made of Jap-a-Lac grained paper and the record of two and one-half pint cans of Jap-a-Lac glued together and a black thread wrapped around them to make them look like a record.

The reproducer was a sample can of Jap-a-Lac with a screw fastened to one side for the needle. The sign in front was of glass and had an electric light behind it. The record was turned over with a small motor. The large electric sign was at work all night long, so that the pulling power of this window display was operating long after closing hours.

A little success is apt to make a small man dizzy.

When you meet a stranger get busy and tell your troubles first.

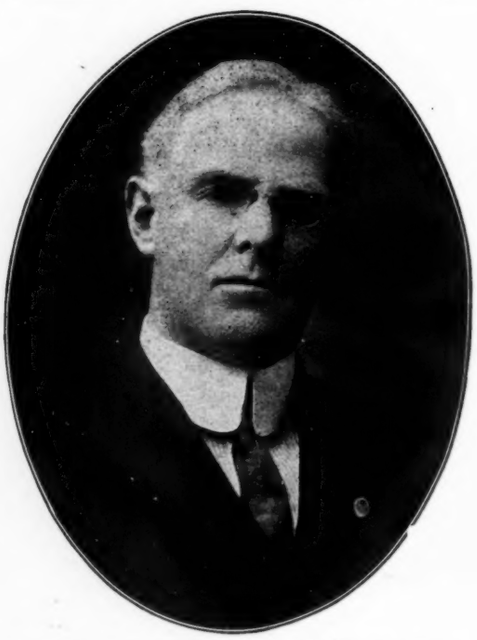
Michigan Is Getting Ready for Big Hardware Convention.

That gratifying progress has been made in the preparations for the annual convention of the Michigan Retail Hardware Association is clearly evident from the following letter from Arthur J. Scott, of Marine City, Michigan, secretary of the Association:

To AMERICAN ARTISAN AND HARDWARE RECORD:

Complying with your request of recent date, I am pleased to give you the following information concerning our coming Convention and Hardware Exhibition.

Our Twenty-Eighth Annual Convention and Hardware Exhibition will be held in the city of Grand Rapids, Michigan, February, 7, 8, 9 and 10, 1922. Hotel headquarters and convention sessions will be at the Hotel Pantlind, exhibit at the Furniture Exhibition building.



Arthur J. Scott, Secretary Michigan Retail Hardware Association.

Our program is getting rounded into shape and many of our members and associate members have consented to give short talks on subjects of vital interest to the trade.

E. J. Foster, Grass Lake, subject: "The Hardware Dealer and His Banker."

W. S. Felton, Engadine, subject: "Buying."

L. B. Gee, Whitehall, subject: "Sales Promotion."

A. L. Kommers, Antigo, Wisconsin, subject: "Turnover," (Mr. Kommers will turn his stock twelve times this year.)

A. H. Nichols, Detroit, subject: "Auto Accessories as a Profitable Line."

Arthur B. Borden, subject to be announced later.

Fred. C. Richter, Traverse City, subject: "He Can Who Thinks He Can."

Colonel H. A. Pickert, Detroit, subject to be announced later.

Samuel A. Davis of Cleveland, store expert, will talk on "Selling, Advertising, Displaying."

Mr. Olin Mason Coward, Chicago, has taken as his subject: "A Shot in the Arm."

Samuel R. Miles, manager of the Field Service Department of the national Association, will talk and give a demonstration, his subject being "A Modern Show Window."

Perry F. Nichols, manager of the Sales Promotion Department of the national Association, will take for his subject "Planting Buying Ideas."

The Question Box will be one of the big features and an entire session will be given to the discussion of the many knotty problems confronting the dealers at the present time.

The hardware dealer who attends this, our Twenty-Eighth Annual Convention, may rest assured that the program will be unusually interesting and instructive, and every minute of the four days spent in Grand Rapids, will be profitably employed.

Ample entertainment will be provided. Tuesday evening there will be a theater party at the Empress Theater and on Thursday night there will be a banquet and entertainment at the Coliseum. There will be special entertainment provided for the ladies.

Courteous treatment, efficient management, and the lack of unnecessary additional expense, coupled with the splendid patronage from our members, have made the Michigan exhibit one of the very best in the United States. We found this year that it was necessary to add additional room to take care of the many applications received from manufacturers and jobbers for space.

Members of the Association are taking more interest in the exhibits each year, and with a view of encouraging this feeling, a Buyers Contest will be conducted as heretofore.

Dealers will receive prizes according to the number of orders placed. An Icy-Hot Motor Restaurant will be given to the dealer placing the largest number of orders, an Auto Robe to the dealer placing the second largest number of orders, Icy-Hot Caraffe to all dealers placing 12 or more orders, Umbrella to all dealers placing 10 or more orders, Genuine Conklin Fountain Pen to dealers placing 5 to 10 orders and an Eversharp Pencil or Pencil Sharpener to dealers placing 3 to 5 orders.

Michigan, the large state Association with a membership of 1,600, is looking forward to the largest and best convention and exhibition ever held in the state.

A. J. SCOTT, Secretary.

Marine City, Michigan, December 23, 1921.

Wisconsin Firm Publishes a General Hardware Catalog.

The Fred Kroner Hardware Company, La Crosse, Wisconsin, has issued a general hardware catalog, which is now in process of distribution to their trade.

It is a closely condensed work of 736 pages of standard 9x11 inch size, with modern two column illustrations throughout, and makes a compact and attractive presentation of this company's extensive variety of merchandise.

The Fred Kroner Hardware Company invites requests for a copy from all trade contiguous to La Crosse who may not have been supplied in the firm's mailing list.

Here Is a Capital Advertisement Without Needless Frills to Distract Attention from Its Message.

Crooks Brothers of Van Wert, Ohio, Know How to Put News Values as Well as Merchandising Values in Their Newspaper Advertising.

There is more genuine news in the advertisement of Crooks Brothers hardware store, reproduced herewith from the *Van Wert Times,* Van Wert, Ohio, than in all accounts of divorces, murders, and suicides which appear in the daily newspapers.

When one has finished reading a narrative of some bloody and sensational homicide and sits down with a pad of paper in front of him to express in words and figures the values which one received from the reading, one finds after an hour's effort nothing but a blank page staring him in the face.

In other words, the stories of murders, suicides, divorce, and other forms of crime add no values of any description to the personality of the reader.

One's fund of knowledge is not increased. There is no enlargement of one's cultural possessions. Instead, there have been added a series of disagreeable and hurtful images to the collection constituting memory.

On the other hand, an advertisement of the kind here under discussion tells a helpful story.

Each item here is an Excellent Value
Hack Saw---Special
Adjustable frame. Will take an 8, 10 or 12 inch blade. Nickle-plated frame and polished wood handle. Union Hardware Company make. Frame and 1 inch blade, at - - - - - - - 39c
Lanterns
No 2. Cold Blast lanterns with long or short globe An excellently made article and one that will give long and very satisfactory service
$1.50
Axes
3½ to 4½ pound axes. Pits are finest grade crucible steel Cutting edge tempered by special process Eyes punched from solid steel Handle carefully selected
$2.50
Pop Corn Poppers
Sheet iron corn popper with sliding covers. Easily opened by special device to prevent burning fingers
40c
Small size wire corn poppers with long wood handle
35c
Auto Robes
54x72 inch Automobile robes Big comfortable and warm Various color combinations and Scotch plaids. Fringed ends. A regular $10.00 value for
$8.00
Coal Hods
17 inch galvanized iron coal hods Open top well made and durable. Even though you have one or two now an extra one comes in handy when the cold weather comes
75c
Cast Iron Skillet
No 3 Cast Iron skillet, inside ground and highly polished. Diameter 6¾ inches. A very handy small skillet that will last a life time Very special at
29c
Crooks Bros., Hardware

Effective Advertisement Published by Crooks Brothers in Van Wert Times, Van Wert, Ohio.

For the householder and the automobile owner, for the mechanic and the housewife, the advertisement holds positive values.

It tells about useful things and does so in a way which is easy to understand.

The descriptions of the various commodities listed in this advertisement are interesting—genuinely interesting—to hundreds of people who need such articles or who would take pleasure in possessing and using them.

The opening statement in bold face type is an honest heading, borne out by the facts which follow.

A study of the text of the advertisement will prove this to be true.

Each item mentioned is, in fact, an excellent value.

For example, a hack saw with an adjustable frame that will take an 8, 10, or 12-inch blade, nickle-plated frame and polished wood handle, at 39 cents is unmistakably a big bargain.

This item of the advertisement, therefore, has distinctive news value. It arrests and holds attention because it has the element of news which consists of something unusual.

In this case, the element of the unusual is the remarkably low price at which the hack saw frame and blade are offered to the public.

In the original, this advertisement occupied a space 7 by 9 inches.

Hence, every word was easy to read, clear and distinct.

It will be noted that there is a generous allowance of white space throughout the composition of the advertisement, and particularly around the bold figures used to state the prices.

This, of course, is the best kind of emphasis, because it is the fundamental emphasis of contrast by which the roving eye is arrested and held.

Apart from the bold face type used as the heading of the advertisement and for the statement of prices, the text of the advertisement is set forth in plain familiar letters.

The emphasis of the advertisement is placed where it ought to be.

There are no distractions in the descriptive para-

graphs so that the prospective customer reads the words under each item without being interrupted by some special type face intruding itself from the paragraph.

It is not necessary to imitate the Fourth of July orator and use a stream of words to say a simple thing. This advertisement is a splendid example of brevity of expression coupled with clearness.

The precise number of words necessary to give an accurate notion of the quality and use of the articles advertised is employed to excellent advantage.

Take, for example, the description of axes in the center column of the advertisement.

Note the brief, snappy, convincing style of the description, thus: "Pits are finest grade crucible steel. Cutting edge tempered by special process. Eyes punched from solid steel. Handle carefully selected."

In the foregoing description, we have all the chief characteristics of a good axe.

The man who is in need of an axe will be much more likely to buy that article from Crooks Brothers after reading this description than he would be to buy it from some other store which does not advertise its commodities with equal clarity and sincerity of expression.

We learn by experience, but we get a great deal of help and suggestion from the experience of others.

Therefore, it is well for the enterprising hardware merchant who is on the lookout for helpful ideas to give a place in his file of advertisements to this very excellent bit of copy. It will help him in devising his own advertisements.

Holiday Greetings Come from Friends of AMERICAN ARTISAN.

It is a source of much gratification to the entire staff of AMERICAN ARTISAN AND HARDWARE RECORD that its readers are also its friends.

Better work can be accomplished, more interest taken in the publication, and a continuous sense of enthusiasm maintained when everyone is consciously under the impulse of warm human service.

There is a tonic, therefore, in the holiday greeting which comes from so many sources.

Among the many expressions of good will and friendliness received may be mentioned holiday cards and letters from the following:

R. W. BLANCHARD, manager of the Chicago office of The Hart and Cooley Company.

JOSIAH B. BORDEN, Borden Stove Company, Philadelphia, Pennsylvania.

H. W. BRAINERD, Adrian, Michigan.

JOHN P. WAGNER, president and general manager, Success Heater and Manufacturing Company, Des Moines, Iowa.

MATTHIAS LUDLOW, former president, National Retail Hardware Association, Newark, New Jersey.

ALBERT R. SISSON, Henry Disston and Sons, Philadelphia, Pennsylvania.

NATIONAL ENAMELING AND STAMPING COMPANY, George H. Harper, Baltimore, Maryland.

ROCK ISLAND REGISTER COMPANY, Rock Island, Illinois.

W. J. KAISER, secretary, Ohio Sheet Metal Contractors' Association, Columbus, Ohio.

E. B. LANGENBERG, Haynes-Langenberg Manufacturing Company, St. Louis, Missouri.

E. C. "BUCK" TAYLOR, Rudy Furnace Company, Dowagiac, Michigan.

R. J. SCHWAB AND SONS COMPANY, Milwaukee, Wisconsin.

H. P. CHENOWETH COMPANY, Jacksonville, Florida.

FRANZ K. KRAG, Chicago, Illinois.

W. I. BUCHANAN, Malleable Iron Range Company, Beaver Dam, Wisconsin.

SAMUEL D. LATTY, president, The Kirk-Latty Manufacturing Company, Cleveland, Ohio.

JAY BRACKETT, president, New York State Retail Hardware Association, Ilion, New York.

THE MANNY HEATING SUPPLY COMPANY, Chicago, Illinois.

JOSEPH STEARNS, Stearns Register Company, Detroit, Michigan.

W. P. LAFFIN, assistant manager of the Chicago office of Tuttle and Bailey Manufacturing Company.

PAUL F. BRANDSTEDT, chairman, Trade Development Committee, National Sheet Metal Contractors' Association, Washington, D. C.

JOSEPH BARTON CHANDLER, Republic Metalware Company, Chicago, Illinois.

PAUL BIERSACH, Consolidated Sheet Metal Works, Milwaukee, Wisconsin.

CHARLES L. HUBBARD, Pittsburgh, Pennsylvania.

W. L. MERSFELDER, 219 Butler Street, Cincinnati, Ohio.

THE GUARDIAN GAS APPLIANCE COMPANY, 1409 Superior Avenue, North East, Cleveland, Ohio.

F. MEYER AND BROTHER COMPANY, Peoria, Illinois.

C. L. ATWOOD, advertising manager, Milwaukee Corrugating Company, Milwaukee, Wisconsin.

J. C. KILROY, Follansbee Brothers Company, Pittsburgh, Pennsylvania.

JOHN P. MCCREA, Pittsburgh, Pennsylvania.

Gets Trade-Mark Registered in Patent Office.

Under number 145,143, Wickwire Spencer Steel Corporation, Worcester, Massachusetts, has obtained

CLINTON

United States Patent Office registration for the trade-mark depicted herewith. The particular description of goods to which it applies is wire cloth of brass, bronze, and copper, black and galvanized; wire cloth for window screen and conveyor belts; wire cloth with diamond mesh, square mesh, and double crimped; locomotive, poultry, glass and fish trap wire netting; wire trellis, wire plant supports, spiral wire fabric for conveyor belts, welded screen and welded wire fabrics.

Application for registration was filed May 23, 1921, and the Company claims the use of this trade-mark since 1856.

Some persons make a life study of things that are no earthly use.

Trade-Mark Is Registered for Steel Rails.

Under number 148,120, Bethlehem Steel Company, Bethlehem, Pennsylvania, has secured United States Patent Office registration for the trade-mark depicted

BETHLEHEM 148,120

herewith. The particular description of goods to which it applies is steel rails. Application for registration was filed May 24, 1921, and the Company claims the use of this trade-mark since about 1886.

Coming Conventions.

The Western Retail Implement, Vehicle and Hardware Association, Kansas City, Missouri, January 17, 18, 19, 1922. Exhibition at Convention Hall in charge of Louis W. Shouse. Headquarters, Coates House. Sessions in Century Theatre. H. J. Hodge, Secretary, Abilene, Kansas.

Pacific Northwest Hardware and Implement Association Convention, Davenport Hotel, Spokane, Washington, January 17, 18, 19, 20, 1922. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Mountain States Hardware and Implement Dealers' Association, Denver, Colorado, January 24, 25 and 26, 1922. W. M. McAllister, Boulder, Colorado.

Texas Retail Hardware Association, Adolphus Hotel, Dallas, Texas, January 24, 25 and 26, 1922. A. M. Cox, Secretary, 1808 Main Street, Dallas, Texas.

Oregon Retail Hardware and Implement Dealers' Association Convention, Imperial Hotel, Portland, January 24, 25, 26, 27, 1922. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Kentucky Hardware and Implement Association, Jefferson County Armory, Louisville, Kentucky, January 24, 25, 26, and 27, 1922. J. M. Stone, Secretary-Treasurer, Sturgis, Kentucky.

Indiana Retail Hardware Association, Convention and Exhibition, Athenaum Hall, Indianapolis, January 24, 25, 26, 27, 1922. G. F. Sheely, Secretary, Argos.

Sheet Metal Contractors' Association of Pennsylvania, Hotel Berkshire, Reading, Pennsylvania, January 26 and 27, 1922. W. F. Angermyer, Secretary, 714 Homewood Avenue, Pittsburgh, Pennsylvania.

Idaho Retail Hardware and Implement Dealers' Association, Boise, Idaho, week of January 31, 1922, dates to be announced later. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

West Virginia Hardware Association Convention and Exhibition, Wheeling, January 31, February 1, 2, 1922. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Nebraska Retail Hardware Association Convention, Lincoln, January 31 and February 1, 2, and 3, 1922. George H. Dietz, Secretary, 414-417 Little Building, Lincoln, Nebraska.

Michigan Retail Hardware Association Convention and Exhibit, Grand Rapids, Michigan, February 7, 8, 9 and 10, 1922. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids, Michigan. A. J. Scott, Secretary, Marine City, Michigan.

Oklahoma Hardware and Implement Association Convention and Exhibition, City Auditorium, Oklahoma City, Oklahoma, February 7, 8, 9, and 10, 1922. W. B. Porch, Secretary-Treasurer, Oklahoma City.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee, February 8, 9, 10, 1922. P. J. Jacobs, Secretary, Stevens Point, Wisconsin.

North Dakota Retail Hardware Association, Convention and Exhibition, Minot, North Dakota, February 8, 9, and 10, 1922. Charles N. Barnes, Secretary, Grand Forks, North Dakota.

Pennsylvania and Atlantic Seaboard Hardware Association, Inc., Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, February 13, 14, 15, 16, 17, 1922. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh.

California Retail Hardware and Implement Association, San Francisco, California, February 14, 15 and 16, 1922. Le Roy Smith, Secretary, 1112 Market Street, San Francisco, California.

Illinois Retail Hardware Association Convention, Hotel Sherman, Chicago, February 14, 15, 16, 1922. Leon D. Nish, Secretary, Elgin, Illinois.

Minnesota Retail Hardware Association Convention, St. Paul, February 14, 15, 16, 17, 1922. H. O. Roberts, Secretary, 1030 Metropolitan Life Building, Minneapolis, Minnesota.

Ohio Hardware Association Convention and Exhibition, Columbus, February 14, 15, 16, 17, 1922. Headquarters, Deshler Hotel. Exhibition, Memorial Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Iowa Retail Hardware Association Convention and Exhibit, Coliseum, Des Moines, Iowa, February 21, 22, 23, and 24, 1922. A. R. Sale, Secretary-Treasurer, Mason City, Iowa.

Michigan Sheet Metal Contractors Association, Jackson, Michigan, February 21, 22 and 23, 1922. Frank E. Ederle, Secretary, 1121 Franklin Street, S. E., Grand Rapids, Michigan.

Missouri Retail Hardware Association Convention and Exhibition, St. Louis, Planters Hotel, February 21, 22, 23, 1922. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

New England Hardware Dealers' Association Convention and Exhibition, Paul Revere Hall, Mechanics' Building, Boston, Massachusetts, February 21, 22, 23, 1922. George A. Fiel, Secretary, 10 High Street, Boston.

Virginia Retail Hardware Association, Roanoke, Virginia, February 21, 22, and 23, 1922. Thomas B. Howell, Secretary, Richmond, Virginia.

South Dakota Retail Hardware Association Convention and Exhibition, Mitchell, South Dakota, February 21, 22, 23 and 24, 1922. H. O. Roberts, Secretary, 1030 Metropolitan Life Building, Minneapolis, Minnesota.

New York State Retail Hardware Association Convention and Exhibition, Rochester, February 21, 22, 23, 24, 1922. Exhibition at Exposition Park. Headquarters and sessions at Powers Hotel. J. B. Foley, Secretary, 412-413 City Bank Building, Syracuse, New York.

Sheet Metal Contractors' Association of Illinois, Rockford, Illinois, March 8 and 9, 1922. G. J. George, Secretary, 523 East Jefferson Street, Springfield, Illinois.

Old Guard Southern Hardware Salesmen's Association, New Orleans, Louisiana, April 20, 1921. R. P. Boyd, Secretary-Treasurer, Knoxville, Tennessee.

Southern Hardware Jobbers' Association, St. Charles Hotel, New Orleans, Louisiana, April 19, 20, and 21, 1922. John Donnan, Secretary, Richmond, Virginia.

American Hardware Manufacturers' Association, Spring Meeting, St. Charles Hotel, New Orleans, Louisiana, April 19, 20, and 21, 1922. Frederick D. Mitchell, Secretary-Treasurer, 4106 Woolworth Building, New York City.

Southeastern Retail Hardware and Implement Association, Convention and Exhibit, May 9, 10, 11 and 12, 1922, Chattanooga, Tennessee. Walter Harlan, Secretary, 460 St. James Building, Jacksonville, Florida.

Hardware Association of the Carolinas Convention, Winston-Salem, North Carolina, May 17, 18, 19 and 20, 1922. T. W. Dixon, Secretary-Treasurer, Charlotte, North Carolina.

Sheet Metal Contractors' Association of Indiana, Indianapolis, Indiana, May 15, 1922. Ralph R. Reeder, Secretary, 312 East Sixteenth Street, Indianapolis, Indiana.

National Association of Sheet Metal Contractors Convention and exhibition in the Athenaeum, Indianapolis, Indiana, May 16, 17, 18, and 19, 1922. Edwin L. Seabrook, Secretary, 608 Chestnut Street, Philadelphia, Pennsylvania.

Mississippi Retail Hardware and Implement Association Convention and Exhibit, Fair Grounds, Jackson, Mississippi, May 24, 25, and 26, 1922. Headquarters, Heidelburg Hotel. E. R. Gross, Secretary-Treasurer, Agricultural College, Mississippi.

National Retail Hardware Association, Chicago, Illinois, June 19, 20, 21, 22, and 23, 1922. Headquarters, Hotel Sherman. Herbert P. Sheets, Secretary-treasurer, Argos, Indiana.

Associated Advertising Clubs of the World, Milwaukee, Wisconsin, June 11, 12, 13, 14, and 15, 1922. Carl Hunt, Secretary, 110 West 40th Street, New York City.

Retail Hardware Doings.

Indiana.

The Lagoda Hardware store of Crawfordsville has been traded to O. M. Woodworth of Indianapolis for an apartment house.

Michigan.

Harry Van Sicle, hardware merchant at Maple Rapids has filed a petition in volutary bankruptcy, according to the *Detroit Free Press* of December 17th.

Ohio.

Eugene Schrader of Girard has been appointed referee in the business affairs of the Girard Hardware Company, which has filed a petition in court asking for an order of dissolution, according to the *Niles News* of December 20th.

Texas.

T. C. Douglas, formerly connected with the Robston Hardware Company of Robston, recently purchased the interests of W. B. Baker in the Baker-Voss Hardware Company.

Wisconsin.

Louis J. Czerwinski recently bought the building and lot at 49th and Burnham Street from Louis Hefle at West Allis, and is now remodeling the building and will open a first class hardware store.

Advertising Help and Comment

Send Us Copies of Your Advertisements. Let Us Help You Get Bigger Results by Advice and Suggestions. The Service Is Free. Don't Hesitate to Take Advantage of It.

Thrifty householders do not buy the things they need for the home on the hand-to-mouth plan.

They save money by taking advantage of bargains whenever offered, even if they are not in immediate need of the articles.

It is to this class of people particularly that The Angle Hardware Co. makes successful appeal in the advertisement herewith reproduced from *The Daily Call,* Piqua, Ohio.

The concluding sentences of the advertisement briefly and strongly

DON'T OVERLOOK THIS

For This Week Only We are selling

50 fee of our high grade Non-Kink 3-4 inch seamless hose for

$7.50

Coupled Complete

Our regular price on this hose is $10.00 for 50 feet.

Better take advantage of our offer and provide yourself with hose at this bargain price.

Buy now for next year.

The Angle Hardware Co.

exploit the thrifty spirit to the benefit of both dealer and customers.

The final sentence is effective with a big percentage of the people, namely, "Buy now for next year."

The publishing of the price in big figures rounds out this advertisement and gives finality to its selling logic.

* * *

Adequately illustrated, well balanced, and effectively worded, is the advertisement of Freyman Tool Company, reprinted herewith from the *Cleveland News,* Cleveland, Ohio.

Prominence is given to the quotation of prices in each instance.

The Freyman Tool Company uses a distinctive design for the

FREYMAN

No. 4 Nest of Saws, Compass, Keyhole and Nail Saw with adjustable handle. Regular $1.98, special at..... **$1.39**

Large size Expansive Bit, will cut ⅞ to 3-in. hole. 2 cutters, special.. **$1.89**

14-in. No. 5 Jack Plane, 2-in. cutting blade, strictly guaranteed, special at..... **$3.19**

FREYMAN

TOOL CO. 309 PROSPECT

BETTER TOOLS FOR LESS MONEY

name and address of the firm which aids greatly in fixing them in the minds of the buying public.

This is good advertising and, of course, also good merchandising.

* * *

On the supposition that S. S. Nave, South Side Hardware Store, makes a practice of running advertisements containing specific descriptions of articles and price quotations, the advertisement reprinted herewith from the *Huntington Herald,* Huntington, Indiana, serves a useful purpose.

It may be said to be institutional and generic rather than specific.

It tells a story of service, of the readiness of S. S. Nave South Side Hardware Store to lighten the burdens of kitchen work with labor-saving utensils.

It does not say what these uten-

WEIGH THIS
WE CAN MAKE YOUR KITCHEN A DELIGHT
Mrs. Good Cook:
You spend so much time in your kitchen that you deserve to have the very best work-saving kitchen tools.
Come in and look at our utensils and you will see the many little things you would like to have.
You can get a big basketful of new kitchen things for just a little money when you buy them from us.
OUR HARDWARE WEARS
S. S. NAVE
South Side Hardware Store.

sils are nor give any idea of their goodness and values.

That, no doubt, is left for elaboration in other advertisemnts.

From time to time it is well to run copy of this sort, although it can not take the place of particularized advertisements.

* * *

Exaggeration Is Harmful.

A store which is continually advertising in a hectic, highly seasoned way, calling every item "the best," "the biggest," "the largest," "the most extraordinary," "the most unusual," and writing each description of merchandise as though it were the most wonderful thing they had ever done, is not building favorable impressions in the minds of its readers.

* * *

Go After 1922 Business

The retailers whose books show a substantial profit for 1921 are the men who advertised persistently and intelligently during the year.

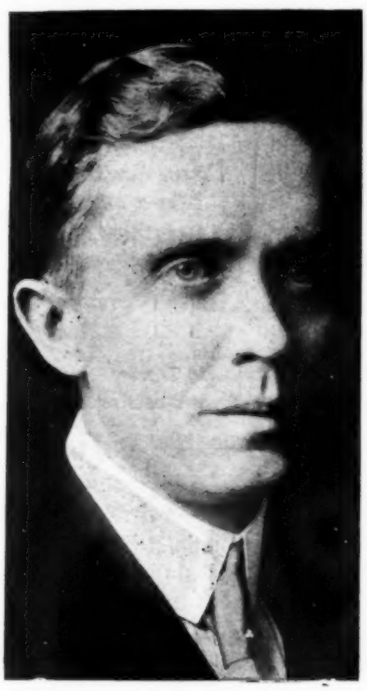
If you want prosperity in 1922, go after the business by means of window display advertising, newspaper publicity, and soliciting by mail.

Make Tests at University of Illinois to Determine the Heat Losses from a Pipeless Warm Air Heater.

The Chief Purpose of the Tests Is to Establish a Basis for Calculating the Overall Efficiency of This Type of Furnace.

Contributed to AMERICAN ARTISAN AND HARDWARE RECORD by A. C. Willard, Professor of Heating and Ventilation and Head of Department of Mechanical Engineering, University of Illinois.

Editor's Note:—Professor Willard is so completely engaged on a final report on one of the other research activities of the Illinois Engineering Experiment Station that he was unable to prepare a special article for this issue of AMERICAN ARTISAN AND HARDWARE RECORD. The article which follows is printed as a result of a suggestion made by him in a letter to us, in which he says:



Professor A. C. Willard, Head of Department of Mechanical Engineering, University of Illinois.

"We are engaged on a very definite program this winter which involves the determination of the proper relation between casing diameter, fire pot diameter and radiator diameter. In these tests, we are also determining the heat losses from a piped furnace with different diameters of casing and types of lining as shown in detail in Bulletin No. 120 of the Engineering Experiment Station for a pipeless furnace.

"I would suggest, therefore, that you run Section X of Bulletin No. 120 as representing one of the most fruitful fields for further research in warm air furnace heating. Copy taken from Bulletin 120 is enclosed, and may be quoted direct if suitable mention is made of the University of Illinois and the Engineering Experiment Station."

Section X, Bulletin No. 120, Engineering Experiment Station, University of Illinois, with illustrations, is substantially as follows:

The loss of heat from warm air furnace systems occurs in part by the radiation of heat from the hot surfaces, as well as by conduction and convection.

These phenomena take place between the hot surfaces and colder air.

Radiant heat becomes useful only when it is intercepted by bodies, which in turn give up heat to the air by conduction and convection. Radiant energy is not transmitted directly to dry air.

To obtain the maximum heat energy from the furnace and connected piping, it is necessary not only to intercept the radiant heat, but also to insulate the exterior surfaces, and thus retain the heat so that the air in its passage though the furnace will absorb by conduction and convection the maximum amount of heat, and at the same time give up the minimum amount of heat when passing through the various pipes and fittings.

Heat losses from warm air furnaces are detrimental to the best efficiency of operation for two reasons, first, because of the actual loss in the heating value of the warm air, and secondly, because of the in motive head brought about by the drop in temperature of the air.

This section of Bulletin No. 120 deals with the various sources of heat loss from a pipeless furnace, and the effect of such heat losses on motive head.

The force or head which produces the flow of air in gravity warm air installations is determined by the difference in weights of the cold air column on one side of the system and the warm air column on the other.

The greater the difference between the weights of these two columns the greater is the air handling capacity of the furnace.

Any loss of heat from the warm air column results in an increased density or weight on the warm side of the system with the result that the motive head is decreased; likewise, any increase in the temperature of the air on the cold side of the system results in a lighter column of air on the cold side and a decreased motive head.

The two cases are exemplified in practice by the piped furnace and the pipeless furnace.

In the piped furnace, the motive head is decreased by radiation of heat from pipes and casing; and in the pipeless furnace the head is decreased by the transmission of heat through the inner casing to the down-coming cold air.

Heat losses must, therefore, be reduced to a minimum if the maximum air handling capacity is to be obtained.

Radiation Losses From a Pipeless Furnace.—The tests herein reported were made for the purpose of estimating the radiation losses from pipeless furnaces, and determining the probable overall efficiency of the furnaces, after making due allowance for radiation of heat from the discharge register.

This radiant heat, although effective in heating, is not measurable with the present equipment, and in previous tests has been included in the item, "Heat lost by Radiation and Unaccounted for."

The amount of this radiant heat can be estimated

and readily included in the overall furnace efficiency.

The tests used as the basis for this discussion were made on a pipeless or duplex register furnace.

It must be understood, therefore, that the following data are correct only for the equipment used and at the particular temperatures stated.

However, they may be applied as an approximation to any pipeless furnace of the same type, over an ordinary range of temperature.

The determination of the radiation losses from the furnace was made by measuring the temperatures and areas of the various exterior radiating surfaces of the furnace, and calculating the losses, using the emissivity coefficients for the various materials.

These coefficients were determined on the special steam drum plant for measuring heat losses from various surfaces.

The accompanying sketch (Figure 39) and calculation of areas indicate the manner in which the radiation losses were assumed to be distributed, and give the various temperatures as measured in test No. 9, December 9, 1920.

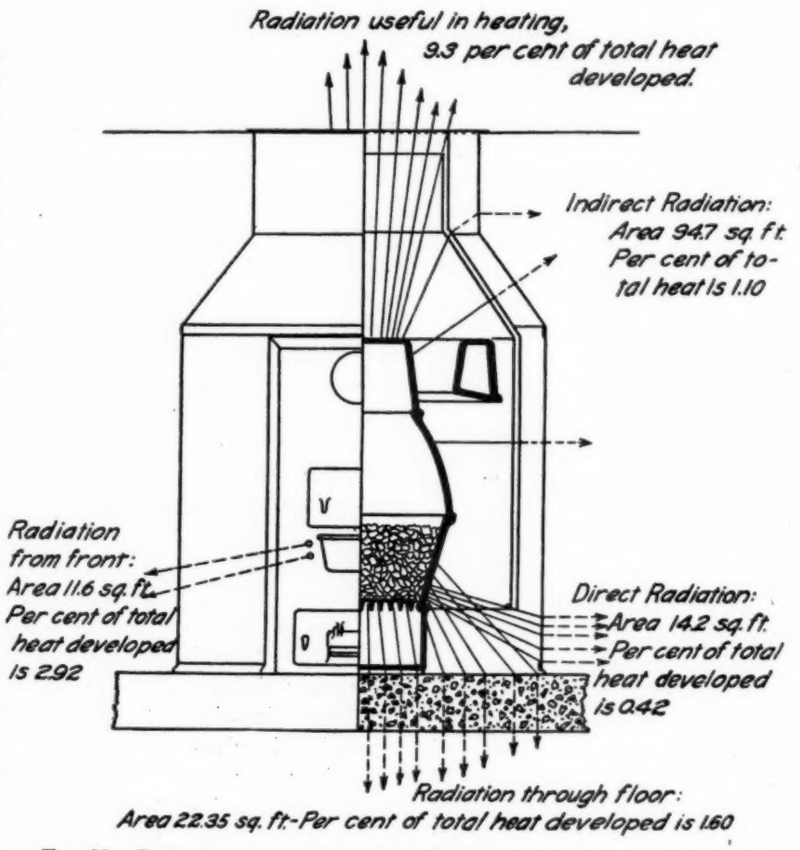

Radiation useful in heating, 9.3 per cent of total heat developed.
Indirect Radiation: Area 94.7 sq. ft. Per cent of total heat is 1.10
Radiation from front: Area 11.6 sq. ft. Per cent of total heat developed is 2.92
Direct Radiation: Area 14.2 sq. ft. Per cent of total heat developed is 0.42
Radiation through floor: Area 22.35 sq. ft.-Per cent of total heat developed is 1.60

FIG. 39. DISTRIBUTION OF RADIATION LOSSES FROM PIPELESS FURNACE

The losses (Table 6) were assumed to occur through, first, the cast iron furnace front, secondly, the lower casing exposed to direct radiation from the fire pot, thirdly, the upper casing indirectly heated, fourthly, the concrete floor, and fifthly, the open register face.

TABLE 6.

Estimated Radiation Losses From a Pipeless Furnace.

Location of Surface.	Loss B.t.u. per hour.	Loss Expressed as Per Cent of Total Loss.
From furnace front...	5,700	48.30
From concrete floor...	3,120	26.50
From low casing below shield	830	7.05
From upper casing...	2,140	18.15
Total loss 11,790		100.00

Heat Loss Calculations Used in

Cast iron front with black Pecora paint.

K from test=2.20 B. t. u. per sq. ft. per hr.

Loss = 2.20×11.6=(300-77) = 5700 B. t. u. per hr.

Concrete floor exposed to radiation.

K from test=2.08 B. t. u. per sq. ft. per hr.

Loss = 2.08×22.35 × (143-76) =3120 B. t. u. per hr.

Casing exposed to radiation from fire pot direct.

K from Bulletin 117=1.33.

Loss=1.33×14.2×(120-76)=830 B. t. u. per hr.

Casing not directly exposed to radiation.

$$\text{Loss}=1.33\times 94.7\times \frac{(107+79)}{2}=76$$

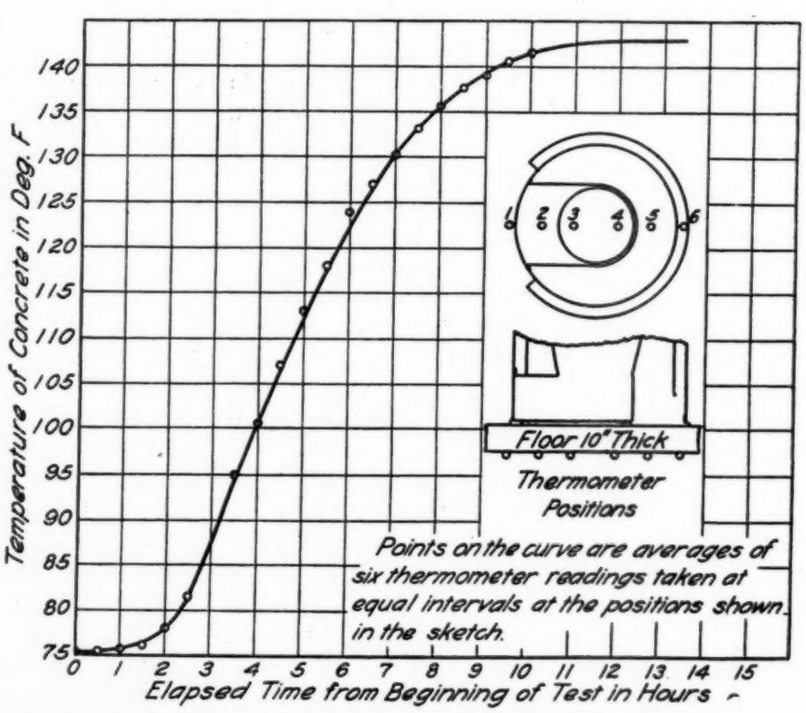


FIG. 40. TEMPERATURE CURVE FOR CONCRETE FLOOR UNDER A PIPELESS FURNACE

$=1.33\times94.7\times(93-76)=2140$ B. t. u. per hr.

Temperatures of the radiating surfaces were measured by thermometers attached with putty or plaster of Paris.

In the case of the concrete floor, a special problem was involved. Since the floor was 10 inches thick it required several hours to heat.

In this case six thermometers were attached to the underside of the floor. Readings of the thermometers were made every half hour during the test (No. 9, pipeless furnace) and the readings averaged and plotted.

The accompany "Heating Curve" (Figure 40) represents these temperature measurements, and indicates that at 143 degrees Fahrenheit the temperature of the floor became constant, and that the emission of heat continued thereafter at a constant rate.

No account was taken of the fact that some heat was dissipated by conduction in the 10-inch concrete floor.

This heat was carried away in the floor and gradually heated it in a wide circle surrounding the furnace.

The actual extent of this unaccounted for loss was not considered to be great, as the floor temperatures surrounding the furnace did not increase appreciably.

The determination of emissivity coefficients for the concrete floor and for the blackened cast iron furnace front necessitated special emissivity tests.

For these tests a drum covered with a ¼ inch coating of concrete was used, and also a black iron drum painted with the same dull black paint as the furnace front.

These drums were tested in the same manner as the specimens described in Engineering Experiment Station Bulletin 117, and the results are, therefore, comparable with those of the previous tests.

Values of 2.08 and 2.20 British thermal unit per square unit per square foot per hour per degree difference in temperature were found for the concrete and the black iron respectively.

Per cent of total heat developed lost by radiation.

$$=\frac{11790\times100}{195100}=6.04$$

Heat loss by radiation expressed as per cent of the heat put into air.

$$=\frac{11790\times100}{127600}=9.24$$

Heat lost per pound coal burned, British thermal unit.

$$=\frac{11790\times10}{152.8}=772.$$

The effect of the radiant heat issuing through the register face upon the heating capacity of the furnace was to increase the useful heat per pound of coal by 1194 British thermal unit, or 8350+1194=9544 British thermal unit per pound of coal was useful in heating, and the efficiency then was increased from 65.3 per cent to

$$\frac{9544}{12791}\times100=74.6$$

This is an increase in efficiency of 9.3 per cent over the value given in Pipeless Furnace Test No. 9. It represents the approximate amount which may be added to the efficiency, based on the heat carrying capacity of the air, in order to determine the true overall efficiency.

All of Us Are Constantly in Need of Education.

Evils and imperfections in commercial, as well as in social phases of life are most effectively overcome by education.

At the bottom of all improvement in our country must be the impulse of social consciousness.

A nation is made up of the units of its citizens, it is true, but no nation can function except through a collection of groups of these units working together in a compact social organization.

It is a peculiarity of any living structure that group interests can be fostered only by promoting the general interests of the composite groups which constitute the organic structure.

The man who sells and installs a warm air furnace is not an isolated individual, nor is the transaction an isolated transaction.

On the contrary, it has relations in numerous directions with other industries, other individuals, the neighborhood, and the nation.

Therefore, the dealer and installer of warm air heaters actually has an obligation to his fellowmen through his craft.

That is to say, he owes it to his country to use honest workmanship and adequate values in the transaction.

From this flows clearly the necessity of education in matters pertaining to the warm air heater trade. The higher the standard of ethics of craftsmanship, the better for all involved.

One of the queries in the questionnaire sent out to the manufacturers of warm air heaters for the Warm Air Special of AMERICAN ARTISAN AND HARDWARE RECORD is as follows:

"Is it not to the interest of all concerned to carry on educational propaganda among dealers and contractors with a view to installing furnaces adequate to the heating requirements of a dwelling?"

Typical, in a way, of the general run of replies is the answer received from I. M. Adams, manager Furnace Department, The Favorite Stove and Range Company, Piqua, Ohio, who writes:

"The curse of the warm air heating business is cheap, small installations, particularly in dwellings built for sale by real estate companies. Comfort is of no interest to the original builder—some excuse to use the term 'furnace heated' is all that is desired."

This evil can be offset and the interests of the public honestly maintained by educating the warm air heater trade to a level of understanding and social consciousness at which the men of the trade will be able easily to perceive the superior ultimate advantages of refusing to participate in or perpetuate this state of affairs, so vehemently condemned by Mr. Adams.

More Accurate Knowledge of Cost of Production and Installation Is Needed in Warm Air Furnace Trade.

No Man Would Willingly Pay Out a Dollar to Get Back Ninety Cents, Yet Many Men Are Doing So in the Furnace Industry.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by I. L. Jones, President of The National Warm Air Heating and Ventilating Association.

To the dealers, jobbers and manufacturers engaged in the warm air furnace industry, in common with those engaged in other lines of business, the year 1921 has been found to be a very trying one and yet we may all be thankful conditions have been no worse.

In an industry such as ours where labor is such a large factor in the cost of the completed article the readjustment to lower price levels must of necessity be a much slower process than where the cost of the materials used is the big element of cost.

In most cases both the installer and manufacturer has probably found the reduction in rate of wages paid has been largely offset by his increased percentage of overhead expense due to the smaller volume of business transacted.

It is no doubt true the lower level of prices on furnaces which has ruled throughout the year has more than reflected the reduction in costs which have been obtained.

Both the installer and manufacturer should make every effort to reduce the cost of furnace installations to the lowest possible point consistent with good workmanship, good goods, and a reasonable profit.

I. L. Jones, President National Warm Air Heating and Ventilating Association.

A reasonable profit must be made if either the dealer or manufacturer expects to stay in business and see that business grow.

Poor workmanship in installation coupled as is oftentimes the case with a furnace of poor construction, has in the past worked untold harm to our industry.

The mystery is why so many men of intelligence, dealers and manufacturers alike, seem willing to tie up their facilities in the closely competitive fields of the furnace industry with little or no profit to themselves and bringing as they do much discredit to the method of heating with warm air furnaces.

No sane man would be willing to pay out a dollar to get back 90 cents, yet that is in effect what many men have done and are doing today in the furnace industry.

A better knowledge of their cost of production and installation should show them the error of their way and explain perhaps why when the year's work is finished their profits, if any, are less than they anticipated.

It is to be expected that better installations will be secured with the inclusion in the building regulations of our cities, of the code for installation of furnaces which is to be drafted by a committee of the American Society of Heating and Ventilating Engineers with representatives from the National Warm Air Heating and Ventilating Association, The National Sheet Metal Contractors' Association, The Western Air Heating and Supply Association, and other interested bodies.

The slogan of every one interested in the industry should be "not how cheap but how well" can a warm air heating plant be installed.

More money has been spent in advertising warm air heating in the past five years than in all the previous years combined, largely, it is true in promoting the sale of the one pipe and pipeless heater, but nevertheless warm air heating.

This publicity has resulted in a better understanding of the merits of warm air heating and every effort should be made by manufacturer and dealer alike to foster and increase the regard of the consuming public for warm air furnace heating.

Join Your Trade Organization.

Building ideas is like building houses.

The more skilled help you have, the easier and quicker the work is done.

To build gainful ideas for your business, you need the help of interchange of experience and methods which comes from membership in your trade organization.

The general average prosperity in which you can participate is made up of the sum of the prosperity of individuals.

Use More of Your Power.

If you had a 4-ton motor truck and were doing a hauling business, you would consider it poor policy to limit the loads to four hundred pounds per trip.

The profit from such small loads would not be enough to offset your overhead expenses.

Similarly, in the warm air heater business, your overhead expenses are relatively the same whether you sell one warm air heater a month or twenty-five.

Use more of your power. Make your overhead expenses carry a bigger load of profit.

Allen W. Williams Expresses His Conviction That the Warm Air Heater Industry Is Daily Gaining Ground.

Analysis of Sales Shows that the Use of Better Grade Warm Air Heaters in High Class Homes Is Materially on the Increase.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by Allen W. Williams, Secretary National Warm Air Heating and Ventilating Association.

The Warm Air Furnace Industry, which includes not only the production of the heaters proper, but the various accessories that are an important part of it, is taking a practical and hopeful view as to the prospects of 1922 and predicting a return to more normal conditions as the year advances.

There is no reason to feel that we will not have a year with much better spring business than the industry experienced in 1921, or that each month will not show an improvement over the same month of last year, which was not the case during the twelve months that have passed.

For some time the manufacturers have gauged their production by the demand and their stocks as a rule are small. Dealers have also liquidated their supply of goods so it is not unreasonable to expect a demand that will commence early in the year, and be supported with prices consistent with the cost of production and free from the fear that prevailed during 1921 of a falling market.

In other words, conditions are more favorable for the production and sale of our goods from now on.

All, in any way identified with our industry, recall the dull months of last spring, but it is encouraging and interesting to note that during some months last fall even the extremely careful buying which prevailed did not prevent a trade that approached normal.

The pipeless heater maintained its popularity well during the past year. It has undoubtedly established a permanent place in warm air heating. Although as the building of new homes increases there is no cause to feel that its sale, which will continue large, will be at the expense of the piped job.

Allen W. Williams, Secretary National Warm Air Heating And Ventilating Association.

The year, 1921, was a busy year for the National Warm Air Heating and Ventilating Association and in spite of the general business depression which prevailed, the membership was increased and the activities of the organization were pushed with real results for the good of the whole industry. During 1922 even more can be accomplished.

The Research Work at the University of Illinois was continued and the results proved that the time, patience and expense generously given to this work have been fully justified.

It is believed that hereafter the practical application of the data obtained will be possible in a larger degree, and it is hoped that the desired testing house may become a reality before long.

The Advisory Committee of the National Warm Air Heating and Ventilating Association and the Research Staff at the University are giving the matter of a special testing course careful consideration.

Recently the efficiency casings of different diameters and the comparative efficiency of lined and unlined casings have been determined.

Every furnace manufacturer and every installer should take the first opportunity to accept the standing invitation to visit the University of Illinois and inspect the furnace research work.

A notable development in our industry last year has been the application of fans in a practical way to our method of heating.

This accessory will grow in favor as those interested come to know of its simplicity and trifling cost of operation as well as how much it adds to the efficiency and comfort obtained.

The demand for the low-priced furnace continues; still it is a satisfaction to find in an analysis of sales that the use of better grade warm air heaters in high-class homes is materially increasing.

There is not a manufacturer or dealer in our industry who should not feel encouraged at the outlook for 1922 for a steadier market and better business than it was possible to predict a year ago for 1921.

There is no doubt that the demand can be quickened in the direction of a steadily increasing volume of sales by a sustained educational propaganda.

When electric lighting for the home was developed to a stage of economy and efficiency, there were still thousands of people using kerosene lamps.

They had to be taught by precept and example that electric light was better, cleaner, healthier, and—on the basis of candle-power—considerably cheaper.

This teaching did not accomplish its object in a day or a year.

The modern warm air furnace is undoubtedly the best, healthiest, and most comfortable system of heating in existence today.

Its general adoption by the householders of this country can be brought about by the same persistent education which has made the use of electricity well-nigh universal.

Progress in Practice and Personnel Has Carried the Warm Air Heating Trade to High Levels of Betterment.

A Big Change, Not Only in the Methods Used, but in the Type of Man Devoting Himself to Warm Air Heating Is Taking Place.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by Arthur P. Lamneck, President National Association of Sheet Metal Contractors.

Regarding from a retrospective angle the last twenty-five years of warm air heating, one can not help but note the gradual, but most evident, change not only in the methods used, but in the type of man devoting his efforts toward this line of endeavor.

A quarter of a century ago, the heating of homes by warm air was struggling through the dark ages of its development.

Nothing was positively known about it beyond the fact that heated air could be conveyed to different parts of a dwelling by means of pipes, and it was generally regarded that anyone with a slight amount of tinning knowledge was competent to install these warm air conduits.

In consequence, the type of man attracted to this line of business was not of the highest. No study was needed outside of some proficiency in cutting and fitting lengths of pipe.

The furnace was stowed away in a hit or miss fashion somewhere in the basement, connections were made to the registers, and the installation was supposed to do its work of heating. After a fashion, it did.

Coal was cheaper then and with persistent and frequent stoking, enough heat was salvaged from the leakage and radiation of the unprotected pipes and faulty joints to raise the temperature of the home to a point where the owner was satisfied after a fashion, simply because there was no better way of accomplishing the results desired.

Arthur P. Lamneck, President National Association of Sheet Metal Contractors.

In other instances, the installation was so grossly mis-installed that the entire system failed miserably. It is quite reasonable that many furnace owners placed the blame on the manner of heating and declared warm air a failure.

The onus of the blame was placed on the system used, whereas the real condemnation should have been attached to the pipes of inadequate size or any other feature which did not properly function.

Possibly the culpability lay with the ignorance of the man who put in the job. His hit or miss, unscientific lack of knowledge and mis-calculation redounded to the effect that warm air as a heating medium was given a severe black eye.

In spite of these early failures, in spite of butchered jobs foisted by incompetents, hot air heating was destined to live and grow.

At any rate, it was a step in advance of the open fire and the base burner and there were a few men of faith who *knew* that under ideal conditions, warm air was the best and most hygienic manner of heating which man could devise, and they set about to learn the hidden reasons why this ideal system was not delivering ideal results.

In other words, they attacked the problem from a scientific angle. The results of their efforts are most evident today.

With these first pioneers as a nucleus, other men were gradually attracted toward this business—men of education and superior attainments.

Slowly the fact seeped into the entire heating fraternity that their business had many abstruse elements and unsolved problems which called for scientific solution, and more scientific minds were pressed into service to coöperate with the practical heads who knew the technical side of sheet metal manipulation and the tinner's trade.

These men were the leaven who eventually produced among heating men the desire for some efficient means of coordinating the knowledge which they had obtained as individuals for the benefit of warm air heating as an institution.

From this grew the National and State Associations of today, and the formation of the Association has raised the tone of the men engaged in this business immeasurably.

Gone are the days of the little tinner, a tinker at best, ignorant except for his knowledge of soldering tools and snips.

This type of man is as extinct in the sheet metal business as the pug dog is in the home.

They are lost in the limbo of the past which has swallowed up and will continue to devour all impediments to progress.

A vacuum and unprogressiveness are the two things abhorred by nature. She fills one up and destroys the obstacle to progress. That is why the old-fashioned tinsmith has disappeared from our midst along with a bad record of worse jobs.

His place has been taken by a remarkably high class of men who are expending every effort to keep their business of heating by warm air progressive and alive.

This trend of desire for more and better information on these and allied subjects has been made the topic of much research and study by experts in the great

universities and technical schools of the country, and courses have been evolved to prepare men for the profession of heating engineer.

One man in particular must be mentioned in conjunction with any remarks upon the progress made in the last few years. He is Professor A. C. Willard of the University of Illinois, holding the chair of Heating and Ventilating in that institution.

His work, carried on at the instigation of the National Warm Air Heating and Ventilating Association, has been richly productive.

He and his able corps of assistants have contributed much of value to the general fund of knowledge along warm air heating lines.

Of course, we will not all be able to talk in terms of the B. T. U. and the scientific parlance of the research laboratory, but there is not a heating man who should not be able to benefit by these findings in a practical way.

We have made great strides during the last quarter of a century, and now the field of forced ventilation looms big. It is difficult to prognosticate what the next few years will bring. However, the future of this industry is in the hands of men big enough and of ample vision to insure even greater progress than has been made in the twenty-five years past.

With building needs growing greater each year, with fuel prices soaring and more homes to heat, it is a grateful thought that no longer is this problem entrusted to men of the mental calibre of the old-fashioned tinner, but that it will be the work of the high type of technical and business man who have been drawn to the most important service of furnishing adequate heating means to the nation.

Says the Cost of Nearly All Merchandise and Labor Is Too Far Away from the Price of Farm Products.

We Don't Hesitate to Spend Millions for Promotion, Why Not Cut Prices, Regardless of Profit, and Give Business a Chance to Recover?

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by John H. Hussie, Secretary, Western Warm Air Furnace and Supply Association.

In my judgment the outlook for the furnace business in the near future is very good.

It must be borne in mind, however, that the cost of nearly all merchandise and also of labor is too far away from the price of the farmer's produce.

Either manufacturers, merchants, and mechanics must come down or the price of the farmer's product must come up.

Today in many western states a farmer must haul into town about a thousand bushels of corn in order to purchase a furnace or an enameled range.

The consequences is that he is not buying and, furthermore, he will not buy until things are more nearly equalized.

I have heard several manufacturers say that price can not come down until volume increases but the consumer's answer to that is that volume will not increase until price comes down.

And there you are.

A stand off, it would seem, but we must remember that the home owner can get along quite awhile with the old heating or cooking apparatus and he will do so.

John H. Hussie, Secretary Western Warm Air Furnace & Supply Association.

My advice, therefore, is to manufacturers, jobbers and retailers: Cut to the bone, regardless of profits this spring and give business a chance to start upward permanently.

You know we must reach the bottom before we climb upward and we haven't reached the bottom yet.

Charge the loss, if any, up to promotion expense.

We don't hesitate to spend millions for promotion. Why not do some of it this coming spring?

I have one more suggestion for furnace manufacturers and that is that they take heed to my old oft repeated prayer and adopt some sane and reasonable capacity rating on their furnaces.

The present system, as published in many catalogs, is unfair to both dealer and home owner in this, that the information given is false and misleading and is, on the face, absurd.

Manufacturers know this and admit it but go right along trying to outdo their competitors in exaggerated statements of capacity.

When manufacturers agree upon a simple, readable installation code and give it to us lowly retailers together with a reasonable statement of how much warm air each size of their furnace will supply at the casing bonnet.

It will then be up to us to show our ability properly to install a furnace and the warm air furnace will begin to come into its own.

Those who may know me, will, of course, suspect that when I speak of retailers I mean retail heating men and not simply sellers of merchandise.

In conclusion: It looks a little as though the manufacturer, the jobber and the retailer might come to realize that their interests are identical and that something in the way of a strong pull together may be impending and for this happy end I shall ever hope, not to mention, pray.

Association Work Is of First Importance to All Who Want to Prosper in the Warm Air Heater Business.

Working Together through the Various Organizations, Dealers, Jobbers, and Manufacturers Can Do Much for the General Welfare.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by R. W. Menk, President of the Western Warm Air Furnace and Supply Association.

The future of the Warm Air Industry and the position it will hold in competition with other methods of heating will depend upon the vision, inspiration, and will power put into Warm Air Heating by those engaged in the line.

Will it go forward to a much higher plane and standard of efficiency, or will its makers and installers of generators and accessories be content to follow the same beaten paths?

During the past few years much has been said and written regarding installation and I believe that it has had a good effect, but there are other features pertaining to the industry that need correcting also.

Everywhere one goes he not only hears about the dreadful installations, but also of the unbusiness-like methods of selling the products, both on the part of manufacturers or jobbers and the installers. It is essential to good business that many changes be brought about along those lines.

R. W. Menk, President Western Warm Air Furnace and Supply Association.

Furnace manufacturers in many instances are discontinuing using means and methods to obtain and hold business that are entirely unwarranted, and a concerted effort is being made on the part of those who oppose irregular methods of doing business to correct these conditions for the ultimate good of all concerned.

During the past, many have not considered it essential to ally with association work (and in a measure they could not be blamed). In many cases, however, a different attitude is being shown, having begun to realize that if their interests are to be guarded it is necessary that they take a hand in shaping the destiny of the industry

You who are still unconfirmed should attend at least one meeting of the Western Warm Air Furnace and Supply Association. You will find that they are doing things.

Everybody takes a hand—results, something better. No flowers—no millinery. Discussion brings out the facts.

Is it not better to get in the wagon and ride than to stand on the curb and knock? Try it—you will get out of association work only what you put into it. Go to the meetings and have your say.

I am wondering how many are giving the Trade Journals the credit they are entitled to for the splendid, unbiased work they are doing.

How many are following closely the many interesting and educational articles published for the benefit of Warm Air Heating? Send them an encouraging word once in a while, and also criticize them when you think they are in the wrong; both result in an extract of something better.

The future and the possibilities of Warm Air Heating are so bright and rosy that to continue along present lines would be un-American as well as unbusinesslike.

Therefore, is it not possible for those who wish to carry Warm Air Heating to a higher standard to do so if they will?

A million hearts are yearning for home. Their dreams will be realized. Their determinations will result in securing them. Never was this subject so important of thought; never so vitally coupled with the destinies of individuals, families and the Nation as the present time.

What kind of heating will be installed? What kind of heating are these prospective home-owners dreaming about? What is the furnace industry doing to procure its just share of the business and will furnace heating be benefited by those installed?

With these facts staring the industry in the face it needs vision and leadership to see that these homeowners find the furnace most practical, most efficient, and most satisfactory.

It is their duty, not only to formulate definite plans to meet the issue, but to enlist all concerned, manufacturers, jobbers, installers, architects and contractors.

This is the season when new resolutions are made. This is the season when annual policies are adopted and programs are outlined for greater success and prosperity. Why not include in them a firm resolve to help raise the standard of Warm Air Heating?

Just as in the physical task of lifting a weight from the ground it is raised quicker and more easily by combining the strength of several men, so in raising the standard of quality and efficiency in the warm air heating business, results are obtained more readily and in greater degree when individual combine their thought and effort through the powerful leverage of association work.

It is wise, therefore, for the individual to join the organization of his trade or industry.

Stop a Valve on a Steam or Hot Water System and the Heat also Stops, but the Warm Air Furnace Never Fails.

Choke Up One Outlet on a Warm Air Furnace and It Will Persist in Giving the Heat Out Some Other Way. Its Service Is the Best.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by Edwin L. Seabrook, Secretary of the National Association of Sheet Metal Contractors.

Consider the flexibility of the warm air furnace. There is nothing like it in any heating system that has ever been conceived. It can almost be truly said that while there is a scrap of it left it will give service and be faithful to its very end.

Start a fire in it with light, inflammable material and it will immediately send out heat.

Put hard or soft coal, coke or any like material into the fire pot, start ignition and while there is a spark of fire in any of these it will deliver warm air.

The drums can be burned out, or nearly so, the fire pot cracked in a dozen places, the grate broken, twisted out of shape, or clogged up so that it can not be shaken, a hundred and one other injuries inflicted, but the old warm air furnace will struggle on and give out heat.

There is hardly anything in nature that equals it for flexibility and service, under great disability. Just as long as there is a piece of it that can be connected up with a smoke pipe to the chimney and get a draft, or "pull of air," inside the casing, the old hot air heater will respond.

Man has never conceived a heating system that equals the warm air furnace, operating under all conditions, that is so dependable and always does it best even in the most adverse circumstances.

Edwin L. Seabrook, Secretary of National Association of Sheet Metal Contractors.

This commendation of the warm air furnace is not a joke nor humor—it deserves everything, and even more, that can be said in its favor. Can you imagine any other heating system, with its vital parts injured, and still very patiently doing its work and sending up heat?

Stop a valve on a steam or hot water system and the heat also stops. Choke up one outlet on a warm air furnace and it will persist in giving the heat out some other way.

When something happens to all the other heating systems, they give one groan and give up the ghost, so far as generating any heat is concerned.

The flexibility of the warm air furnace has a great deal in its favor, but this most commendable feature has also operated against it, both individually and collectively.

It was so flexible that no matter how it was patterned, designed, put together and installed, it was bound to do the thing for which it was made. It simply could not help it. The flexibility, dependability and willingness to do its very best made it very easy for the manufacturer to let it go as it was. Somebody conceived the patterns for a warm air furnace, they were cast, put together and the thing gave off heat.

The inclination of the maker was to let well enough alone. "It gives out heat," he would say, "why bother with further experiments or investigations or any of the so-called csientific principles. It gives out heat; let it go at that. "Go out," he would say to the sales department, "and put it on the market."

Failure was almost impossible with any make or design of a warm air furnace and so the incentive among a number of manufacturers scientifically to investigate the possibilities for improvements seemed to be almost totally lacking.

A number of makes were cast from the same patterns, year in and year out, over a long period of time, without the slightest change of improvement.

It seemed to be taken for granted that because the furnace gave out heat under any and all conditions, even when it became a cripple, that it was the acme of perfection and that scientific investigation and study as applied to every other line of industry, and particularly to other heating systems, was unnecessary.

Verily, the patience, good nature and willingness to do the work assigned to it, even under the most unfavorable conditions, poor construction, and sometimes worse installation, was almost the undoing of the warm air furnace.

A change, however, has taken place and perhaps a few bits of history, or refreshing the memory, as to just what led up to the splendid work of freeing the warm air furnace from many of the obstacles that prevented it from doing its best might not be amiss. To some of your readers it will probably be a repetition, but to many others it will be new and, it is hoped, to all interesting.

The starting point is probably on a Friday after-

noon, in the middle of August, in 1907, at the Hollenden Hotel, in Cleveland.

The third annual convention of the National Association of Sheet Metal Contractors had adjourned and the Board of Directors were in session. Cooperation between dealers and manufacturers in all lines of sheet metal supplies was much desired.

Some one suggested that it would be a pretty good move to link up with the warm air furnace manufacturers. Why not appoint a committee from the Association and ask a like number of manufacturers of furnaces to serve also?

The suggestion went through almost with a hurrah. Every one in the room saw the manufacturers tumbling over one another to serve on such a committee. It was easy to get the membership side of the committee from the Association.

Then began the hunt to find four furnace manufacturers who would do likewise. There were personal interviews and letters, declination, "excuse me, please," with many reasons why this one and that one could not serve.

It was early in the Spring of 1908 when the committee was finally completed. It was composed from the Association of Whilmore R. Taylor, Philadelphia, Pennsylvania; Arthur McManus, Hartford, Connecticut; James Brown, Rochester, New York; Frank Smith, Norfolk, Virginia. From the furnace manufacturers: Abram Cox Stove Company, Philadelphia, Pennsylvania; International Heater Company, Utica, New York; Syracuse Stove Company, Syracuse, New York; Barstow Stove Company, Providence, Rhode Island; Thatcher Furnace Company, New York; Estate of P. D. Beckwith, Dowagiac, Michigan; L. J. Mueller Furnace Company, Milwaukee, Wisconsin.

Thus originated the Warm Air Furnace Committee of the National Association of Sheet Metal Contractors, which has held so prominent a place in the work of that Association ever since.

The first meeting of this committee was held in Philadelphia, in April, 1908. Fred Moore, of the International Heater Company, came on from Utica, New York; Arthur McManus from Hartford, Connecticut; Charles Prizer, of the Abram Cox Stove Company.

Whilmore R. Taylor and the writer attended that first meeting. Surely the outlook for the committee, coping with the problems of a big industry that showed signs of lagging, were not over bright.

Some one suggested that as the annual meeting of the stove manufacturers was to be held in New York the next month, why not ask the furnace manufacturers to attend that meeting also and talk over the matter of a national organization.

The call was sent out for this meeting, it required a great deal of faith, but if anything was to be done it would have to be by organization. The attendance was a surprise to those who called the meeting. An organization was immediately effected and the Federal Furnace League was the name adopted.

The League started out with high ideals and really wanted to accomplish something and it did lay the foundation for the practical and scientific work that later developed.

One of the first things the League did was to compile a "Warm Air Furnace Hand Book," probably the first of its kind in the warm air furnace field. The work of compiling the data was assigned to Clarence M. Lyman, now sales manager of the International Heater Company. A few of these books are still extant; but, of course, it has been superseded by recent works embodying the results of up-to-date research and scientific investigation.

Looking back on the work of the League it was really ahead of its time in what it sought to accomplish.

In its work of testing furnaces and scientific investigations it lacked many of the things which are today available for that purpose and are utilized in the present investigations carried on at the University of Illinois.

At the meeting in Detroit in the Spring of 1913 the Federal Furnace League agreed to disband. It commenced a work which for various reasons it seemed impossible to continue. This disbandment of a national organization of furnace manufacturers seemed to give the industry a set-back.

At the Washington, D. C., Convention of the National Association of Sheet Metal Contractors, J. A. Daugherty, of Nashville, Tennessee, was elected President. Whilmore R. Taylor, who had served as chairman of the Warm Air Furnace Committee since its inception, wished to be relieved of that position.

Realizing the importance of the warm air furnace part of the sheet metal industry and the need of aggressive work on the part of that particular committee, President Daugherty appointed John H. Hussie, his predecessor in office, chairman of the committee.

The new committee chairman started out with a definite plan. It was to bring the manufacturers of warm air furnaces together once more. It is not easy to build a national organization on the ruins of a previous one and out of the same material.

Mr. Hussie started in at once and through the Fall and Winter months of that year hammered away (hammered is the right word) for a national organization of furnace manufacturers.

Week in and week out he wrote letters until finally he had an answer, in some form or other, from practically every firm making furnaces. It was not an easy thing in those months to get answers from those who had become discouraged in the very thing the writer was trying to promote.

Persistence finally won, however, and Mr. Hussie received enough assurances to warrant the calling of a meeting. This was held in Cleveland, in February, 1914, and the attendance, like the one that organized the Federal Furnace League, was a pleasant surprise. The discussion about organizing again was prolonged and at times somewhat animated. It is human to look back on failures rather than to the future for successes.

The result of this meeting was the organization of the National Warm Air Heating and Ventilating Association. The credit of bringing the furnace manufacturers together, under the most discouraging circumstances from an organization standpoint, was due

entirely to the energy, patience and persistence of Mr. Hussie.

The association organized at that time now includes in its membership practically all of the warm air furnace manufacturers, together with those making furnace accessories.

What this association has accomplished in developing the furnace industry is almost too much of recent history to need any comment at this time. Its activities were checked during the war, but it kept in view what it hoped to accomplish when conditions became settled.

It inaugurated a big advertising campaign for presenting the merits of the warm air furnace. Its plans in this respect, however, never reached full maturity.

The greatest service that it is rendering to its members, the dealers and the users of warm air furnaces is the investigations carried on under its auspices by the University of Illinois.

Some generation-old practices of the industry were found to produce the opposite of what was desired. The scientific work of Professor Willard and his assistants at the University is developing into untold value to the manufacturers and installers, or will be, if the results are utilized.

The new Association, built on the ruins of the Federal Furnace League, has carried on and developed the work that the League originally planned.

The results already secured justify many times over its existence, and it is just at the beginning of what can be done to promote in conjunction with the installers through the National Association of Sheet Metal Contractors, a nation-wide and essential industry.

The warm air furnace is flexible enough to respond to all the efforts, however varied, to place it in its right place among the heating systems.

Use of Fan Recommended for Warm Air Furnaces.

Dr. W. A. Evans, who conducts the department on "How to Keep Well" for the *Chicago Tribune,* tells in a recent contribution to that column about certain experiments made by Dr. E. R. Hayhurst of the Ohio State University with the warm air furnace which heats his residence.

The following is a summing up of Dr. Evans' article:

"For three winters, Dr. E. R. Hayhurst of the University of Ohio has been experimenting with the house in which he lives, to determine the possibility of making the air in a moderate sized, inexpensive furnace heated house comfortable and healthy during winter weather such as prevails in central Ohio. The house is heated by a furnace.

"The conclusion he comes to is that it can be done. The apparatus needed and its cost is about as follows:

"1. An ordinary warm air furnace, with arrangement for circulation of air in the rooms and back to the furnace.

"2. A humidifying device, costing about $24.00, with an additional expense of about $5.00 for attaching it to the furnace.

"3. A small portable electric fan, costing about $10.00, the same type of fan used to cool with in hot weather.

"4. A couple of thermometers, costing about $1.00 each.

"5. A hygrometer or psychrometer, costing $4.00 to $10.00.

"The current to run the fan three to six hours a day will cost but a few cents daily. The cost of evaporating the water to humidify will about equal the saving through keeping the temperature of the rooms lower.

"The temperature can be kept at 68, or even as low as 60, with comfort, if the humidity is maintained at 45 or 60 per cent. A humidity as high as this will cause deposit of water on the window glass. This does no harm to health or to anything else. Nevertheless it is better to use double glassed windows, and all cracks should be closely caulked around windows, doors, and other apertures, both to prevent condensation of water and to prevent water loss and heat loss and air loss from leakage. This is especially necessary on windy days.

"The use of the fan is necessary to get the heat out of the furnace.

"On days when the temperature was above freezing Dr. Hayhurst did not find it necessary to humidify. The ordinary sources of moisture contributed to the air all the water it needed.

"On very cold days it was found advisable to supplement the humidifying apparatus by evaporation from a wet cement floor. On such days he used the hose to keep a section of the floor wet near the furnace all day, and at bedtime there was enough water there to supply the air for several hours.

"Heating a room with an open fire, or by naked, natural gas flames, contributed considerable moisture to the air—in fact, enough for comfort in an ordinary room on an ordinary day.

"The ordinary evaporating pans on radiators and on the sides of furnaces are practically worthless unless they evaporate many gallons of water a day."

Make a Friendly Visit to Your Customers After Installation.

No sale of a warm air heater is ever finished.

The payment in full by the customer ends the transaction so far as balancing of the account is concerned. But the sale goes on for good or ill, according to the attitude of the installer and his customer toward each other.

That is why it is of great good to the business of the installer to do anything that he reasonably can to satisfy his customers, to make a good impression upon the customer and thus spread favorable talk about the warm air heater and the installer among the neighbors and friends of the customer.

There are hundreds of successful warm air heater dealers in the country who know this to be a fact and who shape their course accordingly.

Biggest Furnace in the Universe Delivers Heat for a Distance of Ninety-three Million Miles without Pipes.

Heating Engineer Explains Advantages of Pipeless Warm Air Heater and Corrects Wrong Impressions as to the Scope of Its Service.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by George W. Turton, Heating Engineer, Belleville, Illinois.

After several years of constant and exclusive application of full time and effort to the study and development of the pipeless heating industry, I am frequently told, in a manner which indicates absolute sincerity, that pipeless heating is but a halterless nightmare.

Only a few days ago I met the manager of one of the largest stove works in the country. The conversation drifted through several avenues to the pipeless subject.

At once he assumed the I-know-better attitude and he politely though emphatically informed me that if I really meant to tell him that a pipeless could be made to warm the second story of a two-story building, he could not refrain from telling me that if I were not deliberately lying, I had lost complete respect for the truth.

No one could reasonably expect a druggist to know how to raise alfalfa, or a tinner to cut a pattern for a silk dress; but dollars to doughnuts, if I had told this man who had made his stove for more than a quarter of a century, with success, that it would not live up to his claims, he would have opened the draft and said things not common in print.

The Sun

The original Pipeless Heating System, located by the Master Engineer, heats the entire world from a distance of 93 million miles without a pipe of any kind. That is Nature's Way.

That same belief as to successful pipeless heating is harbored by many more at present in the heating business. Many readers of this magazine are refusing to admit the facts and are barring the way to their own greater progress.

There is always a percentage of followers of every occupation who follow grand dad's prescriptions. They lack the inventive and progressive mind and, seemingly, the knowledge that methods once thought correct and proper have been proven either partially or wholly wrong; that "the world really do move," which in a very short time renders obsolete things and ways once the height of intellect. It is these who either can not or will not see the pipeless present and future.

Outside of the heating profession there are thousands who have never heard of a pipeless and are totally ignorant of its workings.

Recently I called, by request of the management, to interview a large hardware concern that is considering the addition of a pipeless line.

Several of the road salesmen were called in for opinions. One of them, in all seriousness, asked if the pipeless really consumed all the smoke, and how this was done. On being informed that a smoke pipe is necessary, he said: "I thought it was pipeless!"

Then there are those who have little faith in the pipeless, because it is a comparatively "new thing" in the heating line and possessed of an uncanny something not generally understood.

How many heating men understand electricity—what is it and how an incandescent light is produced in a globe attached to a wire? Yet their homes and business places are equipped with these mysterious things and they do not question their ability to produce light and heat when it is desired.

But these same heating men will shy at the claims for a pipeless heating system and call it impossible. Why this inconsistency? Surely with the thousands and thousands in use the results are no more a question than is the light. But they attempt justification

of their skepticism, by saying it is a new departure and hence questionable.

Is it a new fangled idea, or is it the oldest method in existence?

The pipeless heating system is as old as creation itself, and the most simple one imaginable—so simple that we failed to discover it until quite recently.

It is a human trait (and handicap) to consider all things difficult, and waste energy seeking for a solution of the mystery, when if we but understood the simple laws of nature, we would find the supposed problems solved and waiting our comprehension.

The sun is the original heating system supplying sufficient for the entire world. And what goes to waste would suffice for a few more. Here is a tip for some ingenious mind to bottle up some of the surplus for use when "Old Sol" is off of the job.

From a distance of 93 million miles the heat is delivered to earth without a single pipe of any kind. A real pipeless system isn't it? And who has the audacity to say it doesn't work?

Detail discussion can not be attempted here. Suffice it to say that the heat carried by the ether waves is reflected by the earth and distributed by air currents in motion—circulating, invisible air currents.

When they move about with ease and grace we call it a comfortable day. When the movements become violent as in a storm, we have an extreme. And when they cease to move, as on a sultry summer day, we have a depressive feeling.

All of these conditions are produced by the different types of heating systems made by man, which we shall explain more fully later.

As the sun, or daddy pipeless heating system, heats the universe, so will the junior sun, placed in your basement, heat the entire house, which is but a small portion of the universe surrounded by four walls and subdivided into rooms.

It is this enclosing and subdividing which tends to present a contrast. But if you are thoroughly familiar with conditions outside, you will find precisely the same within the house, created by the fire in the furnace in the basement.

You have radiation, deflection, and circulation in both cases, according to the laws laid down by the Master Engineer.

The body of the heater radiates to the air surrounding it which moves on and is deflected by the ceiling and walls and its circulation resisted by doors and partitions. This resistance is the handicap placed on man's system, which can be satisfactorily overcome by understanding the rules of nature's system.

One of the principal factors in any and all heating devices ever designed, is air circulation. The nearer we approach perfection in circulation, the more efficient is the heating system. Hence the claim of highest honors for the pipeless is not mere prattle, for its very foundation is circulation.

The once supreme but now antiquated stove could not function without creating circulation, though in a very limited degree compared with the modern pipeless.

Many, supposedly better informed on the subject, have been heard to argue the disadvantages of certain systems because they lacked the feature of circulation. This is an erroneous idea which must be corrected before a true comparison of the several types of heating systems can be properly understood.

In a future issue I shall enlarge on this; and also attempt to make plain that while all pipeless systems are strong on the desired factor, circulation, some because of faulty construction, are decidedly too strong, creating that condition above referred to as a stormy day.

Others the opposite and depressing effect. While a real system, in harmony with nature's dictates, provides that even, smooth, balmy atmosphere so invigorating and comfortable that home is a place in which it is worthwhile to linger.

It Pays to Learn All You Can About the Warm Air Heater.

A salesman can sell watches without knowing how to make a watch.

But he would be a better salesman if he knew how watches are made.

He would be able to give more intelligent service and to meet the requirements of the customers with more accuracy and satisfaction.

The same holds true of the warm air furnace. A dealer may be able to sell a warm air furnace or to install a warm air furnace without knowing how to make a warm air furnace, but he can sell or install a warm air furnace more efficiently if he knows how the warm air furnace is made.

That is the reason why some of the leading manufacturers are of the opinion that it helps the dealers to come to the factory and go over the plant and study the operations necessary to manufacture the furnace which they sell.

The more you know about the thing which you handle, the better equipped you are to give service with it.

Pipeless Furnaces Are Selling Through the Regular Trade.

Much ill-feeling was engendered during the early days of the pipeless warm air heater by the fact that it was marketed in some instances through channels outside the trade.

The pipeless was installed by men who had no warm air heating experience and who had never served any apprenticeship to their craft.

A number of legitimate installers—competent men of years of practice and good workmanship—were embittered against the pipeless warm air heater because of this method of selling and installing it.

The answer of the manufacturers to criticism along this line is that they were forced in the beginning to seek an outlet for their product to dealers outside the trade because of the opposition of the regular warm air heater dealers and installers.

More and more, pipeless warm air heaters are being installed by regular warm air furnace men who are thoroughly familiar with all the requirements of efficient installation.

Hauling Goods Across America with Oxen Was Once a Normal Way, but We Are Not Going Back to It.

There Is No Logic in the Talk of Back to Normal Prices Because No Fixed Normal Exists in Any Phase of Life or Business.

If it were possible to read the mind of the average man in any walk of life and to arrange in ordinary sequence the jumble of vague ideas which he possesses as to the meaning of "back to normal," it would be discovered that comparatively few persons have distinct notions as to the significance of the expression.

The ideas which we would be able to arrange and classify out of the brain of the average man would be crude pictures, comparable with the scrawls of the school boy.

The fact of the matter is that not one in ten thousand takes the trouble to dissect the expression "back to normal."

Hence, there is vagueness in the general mind as to what constitutes price adjustments and the reason for them.

Indeed, the whole question of price readjustments by a movement back to normal is predicated upon a false principle.

There is no "going back to normal" except in the rare instances such as that of the hairy Ainu of Japan, the original white race which is in a state of degeneracy, or the Maya Indians of Yucatan, whose country abounds with remains of a once beautiful civilization.

"Back to normal" in most things means to lose the gains of progress.

The "normal" of one stage of civilization is abnormal with reference to the stage which preceded it.

The first steamboat which carried freight and passengers was abnormal with reference to the sailing vessels.

There would be no fast ocean transportation today with all the benefits which it implies to commerce if the people in the first days of the steamship insisted on going back to "normal."

The pioneers of American expansion made slow, painful, and dangerous headway across the unknown prairies and over the transcontinental divide with the "prairie schooner" and all the hardships which voyaging by such a method implied.

Goods in those times were "freighted" by teams of horses and in many cases, even by teams of oxen.

The introduction of the steam railroad multiplied the comforts of the American people by making possible rapid interchange of commodities. Railroads indirectly led to schools and universities and the spread of culture. They were abnormal with reference to the freight wagons hauled by horses or oxen.

To go back to "normal" in the days of the first practical steam railroad transportation, therefore, meant to return to the slow and uncertain method of hauling by horsepower or oxen power. It meant to give up thousands of advantages which increased the comfort, wealth, culture and happiness of the people.

"Back to normal prices" is a meaningless phrase for the simple reason that the "normal" is constantly changing with the complexity of civilization and the advances of commerce.

If we go back to the "normal" of 1914, we will find that that "normal" is abnormal with reference to an earlier "normal," and so we will be compelled to keep going backward till we strike the time when the Indians were willing to barter territory enough to constitute an entire State for a string of beads or a bottle of fire water.

As population grows, the volume of money in circulation necessary for carrying on a business must necessarily expand.

The expansion must not only be in proportion to numerical development but it must be great enough to embrace the multiplying needs of the people consequent upon inventive progress and the additional comforts of existence flowing naturally from such improvements.

The talk, therefore, of inflation and deflation of prices and of currency, has not much import for the man of business today.

They are terms which bankers and economists use without actually analyzing them or, at least modifying them with reference to their relative values.

In discussing the price situation as it affects the production and marketing of warm air heaters, therefore, it is well to avoid the entanglement of such phrases as "back to normal," "inflation," "deflation," "pre-war levels," and similar terms.

Anyone who takes the trouble to study the history of industrial development will soon discover that he is in a domain of investigation altogether different from that which comprises the exact sciences.

Economics is not an exact science. It is, at best, but a collection of probabilities and implies a certain amount of cleverness in striking the average of probabilities that become realities.

In the field of the exact sciences, we know with certainty what to expect. There are no disputes as to the laws of astronomy, chemistry, or geology, although there may be much controversy regarding theories advanced in connection with such laws.

But in economics, in the study of such things as the relation of price to cost or profit, there is no such definiteness of knowledge.

Price is relative. It depends on scores of other factors which themselves are constantly changing.

Into the making up of price enter certain elements which are shifting and unstable. Overhead expenses, raw material, labor, shortage of supplies, excess of demand, popular whim, change in style, new inventions which may revolutionize an industry and render worthless all its existing machinery and equipment—all these influence price.

If it were possible to go back to pre-war prices of warm air heaters, we would have the strange and anomalous condition of manufacturers and installers selling and handling a product for less than it cost.

A few enthusiastic householders might hail them as philanthropists. But bankers, butchers, grocers, tailors, coal men, shoe merchants, and landlords would condemn them most bitterly because of their inability to pay their bills.

In other words, the price reduction would be an added expense to other parts of the body industrial.

Only a general lowering of all prices or all commodities and all kinds of service would make reasonable a lowering of warm air heater prices to the level of before the war days.

That kind of "going back to normal" would not do any good to the people in general. It would be an abnormal normality. The logic of it would drive back to the level of Chinese wages and Chinese prices. It would spell degeneration instead of progress.

So much for the general subject of "return to so-called normal prices."

The foregoing observations do not lead to the inference that there should be no reductions whatever.

They are intended to offset the vague and misleading ideas which are current in many quarters and which produce dissatisfaction, misunderstanding, and ill-feeling.

Certain reductions have taken place since Armistice Day—reductions made possible by the corresponding lowering of cost in the field of materials, labor, and overhead expenses.

In response to a questionnaire sent out by AMERICAN ARTISAN AND HARWARE RECORD to manufacturers of warm air heaters, it is found that there has been a reduction of about 20 per cent in the prices of warm air heaters and warm air heating accessories during the past year.

One of the foremost manufacturers of warm air heaters in the Mississippi Valley, says:

"We believe that the lowering of warm air heater prices would stimulate the business, but we believe that in order to stimulate it to any degree, the prices entering into the construction of new buildings should come down proportionately, together with labor. Our prices are approximately 20 per cent lower than those of December, 1920."

An Illinois manufacturer thinks that there has been too much in the way of concessions to get business and not enough attention to the maintenance of high standards of quality and service. He believes that:

"Manufacturers and dealers in the past few years have worked principally for the builders and their help. It has been a question of how cheap, not how good, their furnace is. Builders have been getting high prices for their houses and one of the most important features in a house is the temperature and should not have the cheaper but the best furnace to do its work. Builders expect now to spend about 4 per cent of cost of building for their heating plant—not much more than the price of a good stove. It's up to the manufacturer and dealer to talk and sell quality and get a good living price."

It is always a difficult task to change one's habits of thinking and one's points of view to meet the requirements of advancement in industry, science, and politics.

During the World War, prices were upset. The old ways of doing business were changed. Government administration was extended over all necessities. High wages and high costs came into effect everywhere.

Several definite things came out of the war which are not yet generally perceived. In spite of its enormous waste of wealth, the war has taught people higher standards of living, chiefly through exchange of cultural ideas between various nations.

We are not going back to the old prices, to the old ways, to the old limitations of commerce.

Workingmen and manufacturers alike are forging ahead toward larger developments. They want more of the good things of life, they want homes, they want a richer existence. Prices must and will adjust themselves to these wants and requirements.

One of the oldest firms of manufacturers in Illinois, established more than half a century ago, expressed the conviction that the term "pre-war" as related to prices and conditions should be forgotten.

"The war set up new conditions," says this firm, "and brought about new problems, all of which have to be adjusted and settled without precedent; and, therefore, there is no foundation in assuming that the before the war price basis is the right basis. In our opinion, the only healthy and safe price basis will be that which is founded on the cost, and as the cost fluctuates, so must the selling price. In time a stable level will be reached, and if that course is pursued, the change will be an orderly one and work the least hardship on the business man and the consuming public. Had it been possible to carry through the building program, such as was prophesied the early part of the year, there would have been a great demand for all types of heating apparatus, and particularly, warm air furnaces."

A Canadian firm of warm air heater manufacturers, widely and favorably known for the soundness of its policies, has this to say about prices:

"The return of furnace prices to pre-war levels will not be a big factor in stimulating building until the other costs also decline to the same level. The average six-roomed house in this market sells for slightly over $4,000 if built on a narrow lot and finished cheaply for competitive purposes—that is, the ordinary workman's type of house. Warm air heating in this style of house would be installed today for anywhere from $160.00 to $180.00, depending on the class of job, so even 50 per cent reduction in furnace prices would have very little effect on the price of the house."

An Ohio firm answers the question regarding prices in this manner:

"It is impossible to consider pre-war prices at the present time. Manufacturing and selling costs are the only satisfactory bases for prices. Compared with our peak price of 1920, our present prices represent a decline of from ten to fifteen per cent on varying units. However, our peak prices did not go as high as many others in our line of business."

Another Ohio company says emphatically:

"We do not believe furnace prices can be reduced to the same level as before-the-war prices."

This straightforward assertion might well be used as a theme for a study of the economics of the price situation.

The days before the war are days of a stage of our national development which is definitely a thing of the past.

The changes which have taken place since 1914 are changes logically connected with our growth commercially, industrially, and socially.

With reference to the end of the year 1921, the year 1914 is relatively as much a period ended and completed as the period of the single horse plow as compared with more efficient mechanisms of agriculture.

One of the aspects of the subject which is productive of considerable confusion is that always in the world—no matter where you go or what country you study—you will find side by side with the most efficient mechanisms and methods relics of a vanished stage of human endeavor.

Thus, for example, the rickety hand loom is still in use in many parts of the world in spite of the marvelous machinery for weaving with which the bulk of the world's textiles is produced.

But it would be absurd to base prices and values of the majority of textiles upon the labor cost of the few yards of fabrics which are turned out on hand looms.

In no sense of the word could we reach a solution of price problems in the domain of textiles by insisting upon a return to prices in effect before Arkwright invented the spinning jenny and made possible factory production upon an immense scale.

Of course, there are many purely sentimental reasons which influence the talk of "back-to-normal"—back to the normal of before the war.

As we advance in life, we are likely to fall into the habit of comparing our present circumstances with those of childhood and we speak of "the good old days."

But there is no substance of reason in these purely sentimental reactions.

The well-fed banker who is driven comfortably to his establishment in a high-powered limousine doesn't really mean it when he speaks of the good old days on the farm when it took him seven or eight hours to get to town with a one-mule wagon.

The good old days of the kerosene lamp are not favorably comparable with the present days of the nitrogren lamp. In those so-called good old days there was no science of lighting—no profession of illuminating engineer.

In a word, the good old days were days, relatively speaking, of hardships.

It is all right enough to return to some of those hardships on a week's hunting expedition; to put up with the mosquitoes, with sand in the food, and scores of other inconveniences of a hunting trip. But none of the hunters would want to live that way all the year round, nor would any of them tolerate such conditions in their own homes or favorite restaurant.

It is well, therefore, for the genuine progress of the warm air heater industry that we concentrate our efforts upon adjusting ouselves and our establishments to the conditions of today and the probabilities of tomorrow, rather than to waste our energies in sentimental reveries about the good old days before the war.

For the dealer and installer as well as for the manufacturer, one of the practical aspects of the price situation is with reference to advance orders. If there is much fluctuation of prices and if there is a great deal of mere rumor going around about price reductions, the trade becomes unsettled. People hold back in the hope of getting lower prices. Business lags. Enthusiasm slackens. The whole trade suffers.

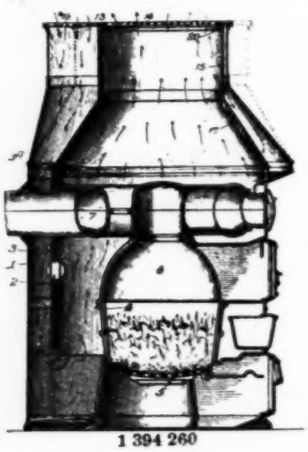
The main consideration, therefore, in dealing with the matter of prices is to recognize that the pressure of building needs in this country is now so great that next season will see the biggest building boom in the history of the United States.

That means that thousands and thousands of warm air heaters will be bought from manufacturers and sold to householders if the warm air heater trade ceases dreaming and gets into action.

Prices will take care of themselves. Always, they have done so. The thing now to do is to get the business and give the service.

Duplex Grating for Pipeless Furnaces Is Patented.

Under number 1,394,260, Wesley J. Johnson, Chicago, Illinois, has secured United States patent rights for a duplex grating for pipeless furnaces, described herewith:



1 394 260

A duplex grating for use with pipeless furnaces having a warm air jacket and a cold air jacket substantially surrounding the same at its emergent end, comprising a cold air section having a marginal portion, and a warm air section lying within said cold air section and substantially touching said marginal portion on one side of the grating, the warm air section being entirely surrounded by the cold air section except at said touching point, whereby to cause the cold air to pass downwardly outside of the hot air section on all sides except at the said touch.

An idea advertised is an idea in the act of being experienced.

The Pipeless Warm Air Heater Has Gained a Position Where Its Service and Economy Are Now Effective.

Majority of Installers Affirm That the Pipeless Is Best Suited to Buildings Having Free Circulation Between All the Rooms.

Occasionally, in the bigger cities, one sees a hansom cab of a former generation drawn by a venerable horse and driven by a grizzled jehu of the ancient days.

It represents a persistence of type.

Prejudice dies hard.

Old habits, familiar institutions and devices have so strong a hold upon us that it is difficult to discard them in favor of better things.

The new always has to fight against the old for recognition.

It is a great many centuries ago since the first scientists proved that the earth is round, yet there are people in our own day who cling to the belief that the earth is flat.

Indeed, you don't have to go outside the United States, and specifically out of the State of Florida, to find people who believe that the earth is a hollow globe and that we are living on the inside of it.

Science makes slow headway.

The evolution of a toe nail is a matter of countless centuries. We do not change readily.

It is necessary to take these facts into consideration in order to approach the question of the pipeless warm air heater from a disinterested angle.

Otherwise, it would be difficult to estimate at their true value the intense criticisms and acrimonious debates which have been caused by the introduction of the pipeless warm air heater.

The man in the middle of a struggling crowd of fighters has not the time to pause for the purpose of writing an essay on the wisdom of serenity and the advisability of settling disputes by calm and peaceful discussion.

His judgment upon the questions under dispute in the fight would not be wholly trustworthy and impartial.

Indeed, he might not even know what started the fight.

The same is true regarding the pipeless warm air heater.

In the first days of its introduction there was, to put it mildly, much controversy and bickering.

Part of the controversies and much of the condemnations arose out of the enthusiasm of the pioneer advocates of the pipeless warm air heater.

Being obsessed by the newness of the new idea, they did the same thing that the first osteopaths did—offered their system as a cure for all conditions.

Of course, a reaction took place against such exaggeration and the pendulum swayed too far in the other direction. The pipeless was condemned as worthless in all conditions.

Things have changed since those first feverish days of the introduction of the pipeless warm air heater, and the pendulum of opinion is oscillating with considerably less violence.

The first rush of the fight is over and most of the participants have had time to resume their coats and vests, brush off the dust of the conflict and look things over more calmly.

It was good for the pipeless warm air heater that all these things happened. Really, they constituted a kind of advertising as well as criticism.

They were thus brought more quickly into general notice and wide adoption than would otherwise have been possible.

The pipeless warm air heater has won a definite place of service in the field of warm air heating.

One of the queries of the questionnaire sent out to warm air heater dealers and installers by AMERICAN ARTISAN AND HARDWARE RECORD is:

"To what kind of buildings is the pipeless warm air heater best suited?"

Numerous answers have been received. For example, J. H. Daugherty, 628 Main Street, Hamilton, Ohio, says:

"I am prejudiced against pipeless furnaces and try to get out of installing whenever possible. However, I believe that they are all right for one-story bungalows that are all open in the interior."

O. H. Neuenfeldt, 1083 Charles Street, St. Paul, Minnesota, gives it as his judgment that small cottages of four or five rooms on one floor are best suited to the use of the pipeless warm air heater.

One of the most progressive and studious dealers and installers in the state of Indiana is C. R. Oberholtzer of Angola. He says:

"This is a rather hard question to answer fully. But fifty per cent of the modern homes built today can be heated with one register."

W. E. Foncannon, Ashland, Kansas, declares that:

"The pipeless warm air heater will warm all buildings where there is a full circulation of air from one room to another."

"Short and square," is the answer of Charles Hahn ("Hoot Mon") 5146 Irving Park Boulevard, Chicago, Illinois, to the query as to the kind of buildings to which the pipeless warm air heater is best suited.

A. F. Gross of Elma, Iowa, gives it as his opinion that any kind of house that does not have closed, tight rooms is suitable for the pipeless warm air heater.

The query to which these and similar answers have been received might have been phrased somewhat differently. Instead of asking: "To what kind of buildings is the pipeless warm air heater best suited?" it might have been better to ask: "To what kind of buildings is the pipeless warm air heater suited?"

This observation is made because many of the answers are based upon the idea of what building is *best* suited.

Thus, for example, A. H. Cobb of Jackson, Michigan, says that buildings with just one room are best

suited for the pipeless warm air heater.

Manifestly, he does not intend to convey the idea that the pipeless warm air heater is not well suited for buildings of more than one room, but that it is *best* suited for buildings with just one room.

A tinsmith at Emporia, Kansas, answered the query with a faint touch of cynicism, as follows:

"One story, perfectly air tight, with all rooms ventilated at ceiling and base board, then put on an extra pair of wool socks, sit down and try to enjoy yourself."

F. Y. Jensen, Ephraim, Utah, answers the query by saying that a one-story building is best suited to the pipeless warm air heater, but he does not say anything about the number of rooms.

The warm air furnace business is very good in Streator, Illinois, according to A. J. Howe, who believes that the type of building best suited to the pipeless warm air heater is one in which all the rooms are connected with one another for free circulation.

"My experience with the pipeless warm air furnace," says G. W. Arnold, Roodhouse, Illinois, "is that it will heat most any house. I have installed several that I was in doubt of as to results, but find them very satisfactory."

One of the enterprising warm air heater dealers and installers of his state is H. R. Landis, of Malvern, Iowa. He conducts a successful hardware business in conjunction with his warm air heater trade and is a persistent and successful advocate of advertising in his local newspapers by means of moving picture slides and mailing lists. His answer to the question of the kind of buildings best suited for the pipeless warm air heater is that they are most effective in a one-story bungalow.

A consistent advocate of trade cooperation through associations is B. F. Stowe of Wyanet, Illinois. He believes that the exchange of ideas and experience which is made possible through conventions and meetings is a big factor in the spread of enlightenment throughout the heating trade. The question of the pipeless warm air heater will be satisfactorily answered, in his judgment, not only by scientific experiments, but by the practical judgment of the men of the trade who are brought together through such associations. It is his opinion that small buildings are the ones best suited to the pipeless warm air heater.

Louis L. Rubil, president of the Standard Furnace and Range Company, Louisville, Kentucky, states that the kind of buildings to which the pipeless warm air heater is best suited are:

"Storerooms, churches (not too large an open area), halls, or any place where no one requires privacy; not dressing rooms, bed or bathrooms. Also, a school room (not rooms)."

Dunshee Brothers of Chariton, Iowa, always recommend one size larger for any furnace job including pipeless warm air heaters. They declare that pipeless warm air heater is best suited to a five-room bungalow.

One of the earnest and sincere installers and dealers of warm air heaters is W. A. Standen of Eau Claire, Wisconsin, who sees much room for improvement in warm air heater installation and who thinks that the trade should not be satisfied with present methods and conditions, but should continue striving to bring about more satisfactory and exact standards of craftsmanship.

Answering the query "To what kind of buildings is the pipeless warm air heater best suited?" he says that buildings in which the pipeless warm air heater is to be used must be open for free circulation.

Known throughout his territory for his progressiveness and constant endeavors for the betterment of the trade, is A. J. Bridges of Bedford, Iowa. He is a keen student of everything connected with his craft.

Answering the query regarding pipeless warm air heaters from a wide range of practical experience, he says:

"I have put them in houses of four rooms.

"I have put them in houses of six rooms.

"I have put them in houses of eight rooms.

"I have put them in business rooms.

"I have put them in churches.

"They will deliver the goods."

"Compactly built houses with large and high openings between the rooms on the first floor, a wide open stairway to a hall above and all bedrooms opening off this hall, doors not too far from stairway," are the requirements of buildings best suited for the pipeless warm air heater in the judgment of R. S. Thompson, Chief Engineer of the Thompson Heating Company, Columbus, Ohio.

A. E. McClaflin, of Bicknell, Indiana, with reference to the question as to what kind of structure is

During the past year, there has been a notable lessening of the tension of partisanship with reference to the pipeless warm air heater.

Improvements in the structure and technique of the pipeless warm air heater have been made which have had considerable bearing upon the problem of giving service to the users of this form of warm air heater.

With the gradual lessening of prejudice, there has come a greater willingness to investigate the merits as well as the disadvantages of this system of heating. Furthermore, the University of Illinois, under the able direction of Professor Willard, has included the pipeless warm air heater in its research work.

The matter of merchandising the pipeless warm air heater through legitimate trade channels is still under discussion in certain parts of the country. It is confidently believed that this matter will adjust itself to the satisfaction of all concerned, and that the pipeless warm air heater will become established as an efficient heating device for certain types of building.

best suited to the pipeless warm air heater, states:

"Public buildings of one large room are the only kind I would personally recommend."

"Square buildings with large colonnade openings," are declared to be best suited to effective use of the pipeless warm air heater by Thomas Baird of Baird-Swannell, Incorporated, Kankakee, Illinois.

Louis I. Drackert of Tipton, Missouri, answers the query about pipeless warm air heaters as follows:

"A one-story building of not more than about six rooms. I find that they give the best results."

In conjunction with numerous other practical members of the trade, S. J. Baird of Republic, Ohio, holds that the pipeless warm air heater is best suited to square buildings with large openings and rooms between which there is free communication for the circulation of the warmed air.

It is a pleasure to reproduce a sentence written by C. L. Epps, Van Wert, Ohio, showing the value which he places upon the questionnaire sent out by AMERICAN ARTISAN AND HARDWARE RECORD in connection with this Warm Air Heater Special. The sentence is:

"I thank you for sending me this questionnaire; and if I have given any information that will benefit anyone by my filling it out even in a small way, I will be well pleased."

Mr. Epps in filling out query Number 7 of the questionnaire, referring to the pipeless warm air heater, writes:

"If a building is open enough to heat with a pipeless, I put in one warm air register and two cold air registers at outside wall and stop the cold air travel over the floor."

Braden and Schmidt of Dysart, Iowa, say that the kind of buildings best suited for the pipeless warm air heater are those with large double doors.

"Four or five rooms, all on one floor with suitable arrangement for free circulation of warmed air," are best suited for getting the most satisfactory results from a pipeless warm air heater in the opinion of G. B. Churchill of Galesburg, Illinois.

R. A. Chandler of Sylvania, Ohio, Secretary-Treasurer of the Chandler Hardware Company, pays close attention to everything connected with the warm air heater trade. In his judgment the kind of buildings for which the pipeless warm air heater is best suited are those where rooms are connected by wide openings and close together.

"Stores, schools, churches and residences are, as a rule, suitable to the use of the pipeless warm air heater," in the opinion of George Collier and Son, Farmer City, Illinois. They declare that:

"To be a success in a two-story building, the pipeless warm air heater must be put in by a man who has accurate knowledge of installation."

"Any kind of a building where the air can get free circulation is suitable to the pipeless warm air heater," is the view of C. F. Bemis, Ruthton, Minnesota.

A. A. Richards of W. D. E. Richards and Son, Roanoke, Indiana, believes that the small type of building with all rooms openly connected gives the most satisfaction when heated with a pipeless warm air heater.

Right Policy of Distributing Pipeless Warm Air Heaters.

Considerable dissatisfaction exists in the warm air heater trade because of the distribution of the pipeless warm air heaters through men who are not familiar with the installation of regular warm air heaters, such as grocers, furniture dealers, garage owners, etc.

This is a perplexing problem, and heretofore it has been rendered more complex by the introduction of personalities which cloud the issue.

A composite opinion of the manufacturers regarding the marketing of pipeless warm heaters might be given as follows:

"There are too many furnace dealers who will not give the pipeless furnace any consideration and they have forced the manufacturers to sell dealers in other lines who have been quite successful."

"We do not favor the distribution of pipeless furnaces through grocers or others who are not familiar with furnace installation. We believe the pipeless furnace can be *killed* by such practice. We must all recognize that there are certain types of houses in which a pipeless furnace should never be installed. In our experience the most satisfactory style of house for this heating is one in which there is a fairly central hall in a square plan house with large doorways or arches, and an open stairway to a central up-stairs hall with bedrooms opening off this central hall within a very small radius. Of course, the pipeless principle has been applied to church heating for years in this market (Canada), where a furnace would be installed in the center of the basement with one register. There would be two cold air pipes pulling the air from the floor of two extreme diagonal corners of the church. Even before that was the old style of Box Stove in cases, whereby the heat radiated from the top and the cold air was gathered along the floor and drawn into ducts at the lower part of the casing."

"Anyone who has intelligence enough to draw a sketch and submit it to his factory for instructions, can successfully install pipeless furnaces. In fact, our experience has been that those who are more familiar with the installation of what you call regular warm air furnaces have been the greatest opponents of sensible pipeless furnace installations. Thousands of our furnaces have been installed by dealers incapable of installing warm air pipe furnaces and our percentage of complaints is much lower than it would have been had these furnaces been installed as regular warm air furnaces by regular warm air furnace dealers."

"We believe that it is not a good plan to sell pipeless furnaces to anyone who does not understand something of the warm air heating business. The warm air heater men themselves have forced the manufacturers to do this, however, because of their prejudice against pipeless heaters. We believe that this is getting less all the time and that the warm air heater installers generally are coming around to the idea of the pipeless furnace."

"The policy of distributing through any one who will take an agency has resulted in many black eyes for the warm air industry at large."

"No. The actions of some manufacturers, however, force other makers to do it in self-defense."

"I don't, but in some cases where dealers have been trained they are very successful. In fact, the furniture dealer as a rule has a good sales force and if a good competent man is among them, I think this is a good connection."

"That depends on the man more than his present line of business."

"Yes. The cardinal features of a pipeless heater are easily understood by any intelligent man. The great success and large distribution of the pipeless furnace during the past eight years has been due to just such men as you mention and that in spite of all the knocking and ridiculing the regular installers of pipe warm air heaters could get out of their system. When we first introduced the Vacuum Pipeless Furnace nine years ago, the pipe furnace installers and manufacturers emitted a low Haw! Haw! but we have sold many thousands through just such dealers including hardware and implement dealers who had no tinshop or no expert pipe furnace installers and with practically no complaints."

"It is the fact that anyone can install a pipeless furnace that gives it its wide salability. The farmer who buys a pipeless from a mail order house puts it in himself. If the sale of pipeless furnaces could have been restricted to legitimate warm air heating contractors it would have never come into existence as a universal panacea. There is no pipeless job so good that a correct multi-pipe system can not be made better. The pipeless furnace has not helped the regular heating contractor. In some cases he has been obliged to handle them by virtue of the low-priced competition involved. But as a whole, the pipeless furnace is regarded by the regular sheet metal man in the same light as a regular physician regards a patent cure-all. The pipeless furnace has been productive of much more publicity in the last four years than warm air heating as a whole in forty years."

Suggest Topics for Discussion in Conventions.

Several topics of uncommon significance have been suggested for discussion at the next convention of the various associations connected with the warm air heater trade and industry.

Query No. 10 of the questionnaire sent out by AMERICAN ARTISAN AND HARDWARE RECORD for the 1921 Warm Air Heater Special is as follows:

"What topics would you suggest for discussion at the next convention of your Association?"

The suggestion is made by John A. Pontius, Geneva, New York, that the next conventions take up the subject of a revision of workmen's compensation rates so that, as Mr. Pontius says, "we who do business in small cities will not be compelled to pay the same rates as those who do business in large cities, where the hazard is much greater."

J. J. Daugherty, 628 Main Street, Hamilton, Ohio, offers three topics for discussion at forthcoming conventions, namely, "Legislation Governing Installation of Warm Air Heating Plants; Cooling Systems for the Summer, and Cost Systems."

A dealer and installer in southern Texas, would like to have placed on the program of conventions the matter of "a standardized chimney in size and height for different houses, according to the size. The same idea for churches, schools, and other buildings."

"Licensing of furnace men by examination to see if they know their business," is the topic suggested by G. W. Arnold, Roodhouse, Illinois.

B. F. Stow, Wyanet, Illinois, would like to have discussed at the conventions of the trade and industry "the practicability of securing genuine charcoal bright plates, well and heavily coated with pure tin."

Louis L. Rubil, president Standard Furnace and Range Company, Louisville, Kentucky, gives this suggestion for discussion at conventions:

"The advisability of avoiding cutting furnace prices by slighting the job and ruining the furnace business by seeing what can be left off the job; taking a definite stand against reducing the sizes of furnace pipe, registers, etc., for mere profit on the job. Good will of the people is essential to prosperity of the warm air heater trade. Let the conventions discuss methods of gaining good will by giving better service and adequate furnaces."

"Methods for increasing the sale of warm air heaters derived from practical experience of the membership," is the subject suggested for discussion by Louis I. Drackert, Tipton, Missouri.

G. B. Churchill, Galesburg, Illinois, thinks a place could be found on the program of conventions for discussion of the topic: "Installing cost systems and separating shops from hardware stores so that one can get an idea what to charge for work."

"Prices, their trend and effect. Service, its purpose and limitations. Credits," are three topics suggested for a place in the discussion at conventions by R. A. Chandler, secretary-treasurer of the Chandler Hardware Company, Sylvania, Ohio.

Canadians Originate a System of Warm Air Heater Inspection.

The principal objection to the licensing of warm air heater installers seems to be the fear of political influence in rendering the licensing ineffectual.

As a substitute for licensing by the State, the plan of inspection originated in Canada may be worth considering.

Briefly described by R. Oaten, Secretary of the Gurney Foundry Company, Limited, Toronto, Canada, the system is this:

"In Toronto there is a Warm Air Furnace Installers' Association, who employ an inspector. This inspector visits the jobs and puts his O. K. on the front of the furnace on a blank form that is supplied for that purpose.

"It is a new idea, started this year, and we can not be sure of its effectiveness until we are through this winter, to say whether or not it has improved the general methods of installing furnaces in Toronto.

"The theory is that if it works, the public will gradually demand the certificate of inspection and this will have a tendency to put business into the hands of reliable furnace fitters who are not afraid of inspection."

Jesse M. McHenry Makes Clear Distinction Between Capacity and Efficiency.

Noted Warm Air Heating Engineer Points Out Fallacy of Capacity Rating and Suggests New Formula for Rating of Warm Air Furnaces.

At the recent annual meeting of the Western Warm Air Furnace and Supply Association, Jesse M. McHenry, the well-known authority on warm air heating and ventilation, read a very interesting and instructive paper, a synopsis of which is given herewith:

"I congratulate you on your buoyant enthusiasm—your cooperative and friendly spirit. May I thank you for your hearty greetings, and for this opportunity to speak to you on a subject of more than passing interest to all engaged in the warm air heating business.

"I have been drafted into this very congenial task by your aggressive and beloved secretary. He did not even allow me to select the subject on which I am to speak—but commanded me to appear before you and to speak on a subject which he arbitrarily assigned.

"I am here in obedience to my orders to speak in the interest of a movement in the right direction, one which has already been initiated and is now commanding considerable attention from those interested in the Warm Air Furnace business.

"There has been a good deal of criticism these past few years, of the haphazard, hit and miss (usually miss) methods of assigning capacity ratings to warm air furnaces.

"There are a few manufacturers which have rules for fixing capacity ratings for their own product, but up to this time, there has been no concerted action having for its purpose, the development of a formula or a standard set of rules for general practice.

"As announced by your capable president, I am to speak to you on the subject of 'Capacity Rating Formula.'

"I am not here to sell you on the formula which has already been proposed and with which some of you are familiar, but I do hope to sell you on the general proposition of a formula or Capacity Rules.

"I can not hope to accomplish my purpose without first convincing you that there exists a vital need for something of this nature. If you will be very patient and I am capable of commanding your undivided attention for the next thirty or forty-five minutes, I am sure that you will agree that the need of some standard method by which furnaces can be assigned proper capacity rating exists.

"When you are so convinced, I am confident that your heartiest cooperation can be depended upon.

"The most convincing evidence of the existing need is the inconsistent and exaggerated capacity ratings now in existence. May I add by the way of parenthesis, that this common practice more than anything else has brought undeserved discredit on the furnace system of heating. This practice is directly and emphatically the cause for the all too common use of undersized furnaces.

> **The inconsistent and exaggerated capacity ratings now in existence have brought undeserved discredit on the warm air furnace system of heating and is the cause of the common use of undersized furnaces.**

"By the way, let me explain, for those who may not have gone deeply into this question, that there is a distinction between capacities and efficiencies of heating appliances whether they are steam, hot-water or furnaces. This is a matter which all should have clearly fixed in their minds. Capacity has to do only with the B. t. u. or heat developed and transferred for useful heating purposes regardless of the rate of combustion or the quantity of fuel burnt. On the other hand, efficiency refers specifically to the percentage of the B. t. u. value of fuel which is developed and transferred for heating purposes.

"One heating system may develop a capacity equalling or possibly excelling that of another system, but at the expense of efficiency. Let us not be confused in these terms. Efficiencies describe fixed and tangible qualities, while capacities, particularly as applied to furnaces, are very flexible and rather intangible. That's the real purpose back of the agitation for the adoption of standard rules for capacity ratings for standard types of furnaces. It means protection to the interests involved because it affords protection to the users of furnaces who have them properly installed. Users of furnace heating systems become boosters or knockers according to the results realized in the use of the system.

"It behooves us, therefore, to encourage the adoption of practices which may operate to protect the ultimate owners or users of furnace heating systems.

"Satisfied users become advocates of the system they own. I do not believe there are any such present—but

if there are present any who may not be disposed to consider these matters from an ethical basis may I urge your endorsement and active support on the basis that better practices will operate to conserve your own pecuniary interests.

"Now allow me to introduce evidence of the existing need of the adoption of some standard rating rule or formula.

"One case indicating this need just this moment comes to my mind. A certain prominent central-west manufacturer decided a few years back to add a line of furnaces with double firing doors. To accomplish this merely necessitated the use of combustion chambers from six to eight inches higher than their old line. This change added to a certain size furnace about eight per cent. more heating surface than previously existed. Instead of seizing upon this favorable opportunity to promote the sale of this remodeled furnace on an increased efficiency basis, there was arbitrarily assigned to it a rated heating capacity twenty-five per cent. in excess of the single door furnace of the same size.

"Personally, I can not understand why manufacturers and salesmen make so much ado about ratings or capacities and neglect that mightier selling force—efficiency. In the case referred to, any keen salesman could demonstrate to the satisfaction of an interested and prospective buyer that he would save one-tenth of his fuel bill by investing in the remodeled furnace, which, by reason of this additional surface, makes the new furnace ten per cent. more efficient than the old. It is a short-sighted policy to think in terms of capacity instead of efficiency, although there is an interrelationship existing between the two from a sales standpoint.

It is a shortsighted policy to think in terms of capacity instead of in terms of efficiency, although there is a close relationship between the two from a sales standpoint.

"One prominent manufacturer which makes much ado about the skill of his engineering department flatly contradicts his own claims and exhibits a total lack of all engineering ability in his catalog data and capacity ratings. The grate area of this maker's second size furnace is 28 per cent. in excess of that of its smallest size. The casing area of the larger is 12 per cent. in excess of that of the smaller size and yet the catalog rating capacity of the larger is 200 per cent. in excess of that of the smaller size. The third size of this same line has a grate area 36 per cent. in excess of that of the next size smaller. The casing area of the larger is 50 per cent. and the assigned heating capacity 86 per cent in excess of the next size smaller. The fourth size of this same line has a grate area 44 per cent. in excess of that of the third size while the casing, or air passing capacity shows an excess of only 25 per cent. Notwithstanding these rather inconsistent variations, the assigned heating capacity of the larger is 200 per cent. in excess of that of the smaller heater.

"Really, men, further evidence of the desirability for the development of means to check such inconsistent and reckless practices as this is not at all necessary, but you will bear with me while I cite one or two more cases.

"I hold in my hand a card showing some interesting and rather startling data based on actual measurements and data from a prominent manufacturer's catalog. There is not in existence a more honorable, and consistent body of men than those constituting the company manufacturing the particular line to which this data refers. There is not a member of this organization who would wilfully exaggerate or make false claims for their product. And yet, inconsistent and rather exaggerated capacity ratings appear in their printed matter. This is unquestionably due to the fact that there does not exist a reliable formula by the use of which they can assign correct and consistent capacities to their heaters.

"There are five sizes used for this demonstration, and the ratios are all on a percentage basis. Please note that three factors only as follows are taken into account. Grate Surfaces, Heating Surfaces and Rated Heating Capacities. The smallest size furnace is used as the basis of comparisons and the ratio of excesses are those which exist between the smallest and the other four sizes. I wish to conceal the line to which these figures apply, so shall not make known to you the actual dimensions of the smallest size.

"The grate area, heating surface and rated capacity of Number 2 as compared with Number 1 are respectively as follows: 37 per cent., 26 per cent., 33 per cent. The comparison of Number 3 with Number 1 results in 79 per cent., 33 per cent., 70 per cent. On this same basis Number 4 as compared with Number 1 on a percentage basis shows 121 per cent., 53 per cent., 138 per cent. Likewise Number 5 in comparison with Number 1 shows percentages as follows: 173 per cent., 80 per cent., 250 per cent.

"The particular point which I wish to bring out in this demonstration is the low ratio of increase of heating surfaces as compared with that of the grate and assigned heating capacities.

"You get the point, I am sure, and if this inspires each of you to measure your own make of furnace

and tabulate the data for comparisons as has been done in this case, I shall feel amply repaid for this effort, and may I add that if you do there may be some surprise in store for you.

"As a pioneer in this rating formula proposition I have been called upon to answer innumerable questions and have carried on a mass of correspondence regarding it.

"In all of this I have encountered but one manufacturer who takes an arbitrary stand in opposition to the adoption of the formula now under consideration by a committee from the Midland Club. This particular company, or rather an individual representing it, takes exception to the formula, contending that it is merely a theory. He submits that his company would not change their ratings to conform with those which would be established through the application of the formula because in doing so a marked reduction in the ratings now established would be effected. It is claimed by this party that in actual service covering a period of years, the rated capacities now assigned to their furnaces have demonstrated the accuracy of same.

"Some very long letters have passed between that party and myself. Notwithstanding the indisputable evidence presented indicating the existence of inconsistencies and exaggerations in their arbitrarily assigned capacity ratings, this well-meaning fellow has not budged an inch. He believes that he is right and he has the courage to stand back of his convictions. I grant you that there is virtue in that characteristic, provided it does not reach the stage of real stubbornness.

"This company manufactures furnaces of the standard top-return flue type. They are well-made heavy furnaces and compare favorably with twenty-five or thirty other makes of the same type now on the market. The size having a 52-inch casing has a 24-inch firepot and 22-inch grate. It is rated 775 square inch pipe area.

"Now I purpose demonstrating that this friend of mine, in common with others is laboring under a false impression.

"At the very low velocity of three feet per second, a pipe having 775 square inch sectional area will deliver 58,320 cubic feet of air per hour. In zero weather the air for an inside circulating system passes into the circulating duct at 65 degrees and discharges through the register at 175 degrees. The rise in temperature, you will please have in mind, is 110 degrees. It requires 116,600 B. t. u. to raise 58,320 cubic feet of air 110 degrees.

"At a combustion rate of 5 pounds per square foot of grate surface, the furnace in question would burn 13 pounds of coal per hour. The average heating value of coal mined in the state in which this particular furnace is made is 13,000 B. t. u. per pound. In thirteen pounds, the amount of coal to be burned per hour, there is 169,000 B. t. u., fifty-five per cent. of which is available for heating purposes. Fifty-five per cent. of 169,000 B. t. u. is 92,950 B. t. u.

"To raise the temperature of the amount of air which this heater is assumed to handle per hour (58,320 cubic feet) requires, as has already been stated, 116,600 B. t. u., or an excess over that which can be developed at an economical rate of combustion by the furnace in question of 23,650 B. t. u. These are facts, friends, and they speak in exceedingly emphatic terms.

"Does not this case indicate to you that some perfectly honest and well-meaning folk engaged in the production of furnaces allow their enthusiasm for their own product to lead them astray?

Capacity has to do with heat developed, regardless of rate of combustion or quantity of fuel used.

Efficiency refers specifically to percentage of B. t. u. value of fuel developed for heating purposes.

"I perceive that these demonstrations interest you and if agreeable to you, I shall give you one other demonstration and then rapidly draw my remarks to a close, as I have already engaged your attention for more than an hour.

"Here is a simple comparison that reveals a remarkable discrepancy.

"The largest size of a certain line of furnaces weighs 275 per cent. more than that of the smallest size. The rated heating capacity of this large furnace is 520 per cent. in excess of that of the small one. Isn't it startling how fast the capacities grow in comparison with other factors?

"This large furnace having a fire pot 31 inches in diameter and a casing 60 inches in diameter is rated to heat 50,000 cubic feet of space. Some wonderful heater. Let us by assumption work this case out to a finish.

"It is a safe and conservative assumption that a house containing 50,000 cubic feet of space would have no less than twenty rooms. At this rate, some of the rooms would be very large. Let us assume that one quarter, or five, would require the use of 12-inch pipes. One quarter 10-inch pipes, one quarter 9-inch and one quarter 8-inch pipes respectively.

Five 12-inch pipes .....565 square inches
Five 10-inch pipes .....400 square inches
Five 9-inch pipes .....315 square inches
Five 8-inch pipes .....250 square inches
"Total square inch pipe area. 1,530 square inches.

"This equals the area of a pipe 44 inches in diameter. At a velocity of 3 feet per second, a pipe 44 inches in diameter will handle 108,000 cubic feet of air per hour. To raise this volume of air 110 degrees necessitates burning 30 pounds of coal per hour. Estimated on a very conservative basis, this would mean the use of over forty tons of coal per season. Two tons of coal per room per season is rather more than the majority of us would care to pay for.

"With all these factors staring us in the face, is there a man here who is unwilling to concede that a revolution in the matter of rating furnaces is in order?

"I have developed a formula not for the purpose of forcing it onto you or anyone else, but I have not felt that I would be justified in attacking or criticizing present methods without offering something concrete as a remedy for the existing evil.

"Allow me to read this formula which is as follows:

"Heaters having grate areas equal to 80 per cent of the area of the firepot at the top shall be rated as follows:

"The pipe area rating shall equal the inside area of the firepot at the top, plus 30 per cent.

"Heaters having grate areas equal to not less than 70 per cent and not more than 79 per cent of the firepot area at the top shall be rated as follows:

"The pipe area rating shall equal the inside area of the firepot at the top, plus 20 per cent.

"Heaters having grate areas equal to not less than 60 per cent and not more than 69 per cent of the inside area of the firepot at top shall be rated as follows:

"The pipe area rating shall equal the inside area of the firepot at the top plus 10 per cent.

"Heaters having grate areas less than 60 per cent of the firepot areas shall be rated as follows:

"The pipe area capacity rating shall equal the inside area of the firepot at the top.

"However, no heater shall have a pipe area capacity rating in excess of 80 per cent of the free area within the casing at the point of greatest restriction.

"This formula, although but semi-scientific, has the distinctive advantage of being consistent and being based also on the careful observation of the performance of hundreds of heaters in actual service.

"Any scientific basis for capacity rating which may develop as a result of the cooperation and efforts which is now being so successfully prosecuted through the Engineering Division of the University of Illinois, I am confident, will closely harmonize with this formula.

"The practical application of this formula is illustrated in the following examples:

Firepot diameter, inches.	Firepot area, square inches.	Grate diameter.	Grate per cent of pot area, per cent.	Capacity pot area plus, per cent.	Capacity square inches pipe area.
20	314	18	81	30	408
20	314	17	72	20	377
20	314	15½	60	10	345
20	314	Less	*Less	(0)	314
24	452	22	84	30	588
24	452	20	70	20	542
24	452	19	63	10	497
24	452	Less	*Less	(0)	452
28	616	26	86	30	801
28	616	24	73	20	739
28	616	22	62	10	678
28	616	Less	*Less	(0)	616

*NOTE—Means less than 60 per cent.

"The capacity ratings as shown are approximately correct for all standard types of heaters having firepots and grate areas as indicated provided the free area within the casing at the point of greatest restriction is not less than 25 per cent in excess of the pipe area capacity assigned."

This Warm Air Furnace Measures Ten Feet in Height.

In the accompanying illustration we show a warm air furnace which is almost big enough to heat all out of doors, so to speak. The dark line down the front of the casing is a five-foot rule, and the men standing in the center indicate that this furnace would be too high to go into any basement of a modern house. As a matter of fact, the top of the bonnet is 10 feet and 4 inches from the floor.

The furnace was one of several made by the Standard Foundry & Manufacturing Company, DeKalb, Illinois, makers of the well known line of Titan warm air furnaces, for Robert Gordon, Incorporated, Chicago, to be installed in one of the large exhibition buildings at Columbus, Ohio.

One of the Largest Warm Air Furnaces in Existence. Cast and Erected by Standard Foundry & Manufacturing Company, DeKalb, Illinois, for Robert Gordon, Incorporated, Chicago.

A detailed description of this installation is now being prepared by the gentleman who had charge of the work for Robert Gordon, and will be published in a near issue of AMERICAN ARTISAN AND HARDWARE RECORD, showing complete layout of the heating pipes, the blower, etc., together with many data secured by exhaustive tests conducted at the time the installation was being made and after its completion.

The Unanimous Judgment of the Trade Is Strongly in Favor of Using an Over-Size Warm Air Heater.

An Adequate Supply of Heat Under the Most Exacting Conditions of Wind and Weather Is What the Customer Has a Right to Get.

It may seem far out of the way to go to the Island of Molokai, one of the Hawaiian group, for an illustration with which to make clear the peculiarities involved in the question of the over-size warm air heater.

This island furnished the theme for the most remarkable bit of writing done by Robert Louis Stevenson.

Fittingly described, the Molokai Island twenty years ago was the place of lost hopes—a leper colony.

Over its gateway might have been written the famous inscription of Dante: "Abandon Hope All Ye Who Enter Here."

The first gleam which penetrated despair of the stricken residents of the island came when physicians began to experiment with chaulmoogra oil for the cure of leprosy.

This remedy gave signs of being effective, but it never quite finished the cure in any case. True, it modified and retarded the course of the disease and gave most welcome relief.

This very month of December, 1921, the newspapers of the civilized world carry the story of several lepers being released from the Molokai Island perfectly healed and permitted to resume their place among their fellow-men in the outer world.

The cure was not brought about by any new remedy. It was consummated by the use of chaulmoogra oil.

Naturally, the question arises why the same remedy which had failed so many times to produce a complete cure is now successful in so big a number of cases.

The answer is that scientists have learned how to use it better and have improved the technique of its administration to the point where it is now practically perfect.

They did not abandon chaulmoogra oil in days when it was giving a measure of relief, because it was better than any other thing that had ever been tried and it gave promise of more desirable results.

This illustration is cited to exemplify the odd twist in the workings of habit and thought.

When the warm air heater was brought into use it had many defects. But it was better than any other system of heating known to civilization—better, that is, for dwellings and places of assembly.

Nevertheless, in numerous instances, it did not meet all the requirements of comfortable warmth under all conditions of temperature. Its use was not generally abandoned on that account for the simple reason that no better substitute was discovered for it.

As in the use of chaulmoogra oil, improvements in the technique of warm air heating, and the manner of its administration, have solved the main difficulties. The solution is a very simple one.

It lies in the so-called over-size warm air heater.

It is a matter of practical experience as against the theoretically correct rules and instructions.

The location of a house, the prevailing direction of the winds, the nature and compactness of the walls of the house, the amount of glass surface which it contains and other factors which vary with changing weather conditions have a direct bearing upon the size of the warm air heater required for a given building.

Theoretically, the size of warm air heater required for a given building is measured by the cubic space to be heated plus allowance for heat losses through walls and glass surface.

These details can be worked out with fairly precise accuracy.

But there are other conditions dependent upon the weather which may not be determined in advance.

Consequently, an allowance generous enough in its proportions to take care of all contingencies of wind and weather must be made in estimating the size of warm air heater required in any given set of circumstances.

For the promotion of the warm air heater trade, therefore, it becomes a thing of paramount importance to arrive at some definite understanding of the proper determination of warm air heater sizes.

In the last analysis, the popularity and prosperity of the warm air heater depends upon the satisfaction which it gives to the public.

In turn, that satisfaction is predicated upon unfail-service in cold weather emergencies.

Naturally, therefore, the first query in the questionnaire sent out by AMERICAN ARTISAN AND HARDWARE RECORD to warm air heater dealers and installers for this Warm Air Heater Special edition, deals with the problem of the over-size furnace. The query is worded thus:

"It is said that over-size tires prolong the life of an automobile. Do you believe that an over-size furnace is better for your business and better for the householder than one which is theoretically barely adequate for the number of rooms to be heated?"

That the necessity of correct practice in this regard is becoming widely appreciated in the trade is evidenced by the positive character of the answers received to this query.

One of the most experienced warm air heater installers in the State of Nebraska, who has served a thorough apprenticeship to his craft, declares:

"I believe an over-size furnace is better for the house owner than one that theoretically is barely adequate for the number of rooms to be heated. The reason is that often in winter when there is a sudden change to extreme cold weather sometimes for several days, an over-size furnace comes in just right, for it is then the house owner can meet the sudden drop in temperature by having a furnace large enough to meet the change in weather and keep the building well

heated.

"In ordinary winter weather," continues this installer, "it will cost the householder no more to run it as far as fuel expense is concerned. In fact, it will not cost as much. Besides, it will create a satisfied customer—and we all know what it means to have satisfied customers. It means more future business for us."

Jay Dillenback of the Empire Metal Tank Works, East Rochester, New York, answers the query as to the advisability of an over-size furnace with an emphatic affiramtive, saying:

"A larger furnace than ordinarily required to heat a given number of cubic feet is a good investment as you don't have to crowd it in severe weather."

In the experienceof D. D. Devore, Oquawka, Illinois, an over-size furnace is better for the installer's business and better for the householder than one that is barely adequate for the number of rooms to be heated. He gets satisfaction and thus helps build good-will for the dealer and installer.

Years of careful craftsmanship have convinced O. H. Neuenfeldt, St. Paul, Minnesota, that it is best to make full allowance for every possible demand that may be put upon the warm air heater in the home. Therefore, he says that:

"It is better to put in a furnace of ample capacity than one that is too small," and that he would rather have one over-size.

A lucrative business has been built up by C. R. Oberholtzer, Angola, Indiana, through a policy of service to his customers. He states that in his understanding of the word, service means not only prompt deliveries and good workmanship, but a careful study of the needs of the individual customer and an honest effort to meet those needs in full. Hence, he is unreservedly in favor of a furnace of such capacity as will give comfort under all conditions of temperature.

"Without question, surplus capacity prolongs the life of a furnace, and is more economical in fuel consumption," declares L. E. Eastman, Manager of Silverton Blow Pipe Company, Silverton, Oregon.

A. F. Gross, of Elma, Iowa, answers the query regarding over-size furnace by saying that he favors "one not too large, but of sufficient size to do away with the necessity of crowding the draft in very cold weather."

A tinsmith at Emporia, Kansas, who is too diffident to permit the use of his name in connection with his answer to the query, advocates the installation of an over-size furnace in every job which he handles.

It would be poor policy for a haberdasher to sell a customer a hat one size too small for his head.

He might be able to persuade the customer at the time that the hat is suitable for him and that he could wear it jauntily on the side of his head and present a more attractive appearance.

The customer wouldn't come back to him for more hats, nor recommend him to his friends.

It's pretty much the same way with warm air heaters. On the plea of economy, you can sell a householder or a building contractor warm air heaters that are barely sufficient to meet the requirements of the house under the best of conditions. A few dollars may be saved temporarily by this process.

In the long run, however, everyone concerned loses. The dealer and installer and building contractor all lose in goodwill. The householder loses in comfort. No one really gains anything by the transaction.

One of the leading installers in Texas writes in answer to the question of an over-size furnace:

"I am strong for the over-size furnace because it cokes the coal and consumes more of the gases and soot, thus saving fuel."

A. J. Howe of Streator, Illinois, is very careful in the matter of installation and is a diligent student of everything bearing upon the subject. He has had remarkable success as an installer, and his opinion, therefore, carries weight. Unqualifiedly, he approves the use of an over-size furnace from the point of view of assured comfort under all conditions of weather and of the good-will which grows out of such satisfaction.

There is no room for debate as to the wisdom of installing an over-size furnace in every dwelling according to the judgment of C. M. Acuff of Acuff Sheet Metal Works, Wichita, Kansas.

The Hensom-Robinson Company of Springfield, Illinois, makes it a rule to study closely the circumstances in connection with every warm air heater which it installs. It is this firm's opinion, based upon accurate observation, that the over-size warm air heater can be relied upon in the most exacting variations of temperature.

"I believe in 25 per cent over-size furnaces," is the terse, but positive pronouncement of F. Y. Jensen, Ephraim, Utah.

A friendly and intelligent interest in its customers has lead the Perryville Hardware Company, Perryville, Missouri, to investigate thoroughly the matter of over-size furnaces. The conclusion reached is that this type of furnace is commendable from every point of view, and that the installation of an over-size furnace means satisfaction and more customers.

G. W. Arnold of Roodhouse, Illinois, never neglects an opportunity to speak his mind on the importance of accurate training and skilled workmanship. He affirms that a trained installer who knows more than the mere motions of the workmanship, will take a pride in fitting a job to the dwelling and in every case he will favor the installation of an over-size furnace.

"Yes," declares H. R. Landis of Malvern, Iowa. "I have put in 190 furnaces and two-thirds of them are over-size and have been very successful."

B. F. Stow, Wyanet, Illinois, writes:

"I advocate furnaces one or two sizes larger."

Louis L. Rubil, president of the Standard Furnace and Range Company, Louisville, Kentucky, answers the query regarding the advisability of installing an over-size furnace in the affirmative, as follows:

"Yes, a larger furnace—that is, one that would do the work in the very coldest of weather without forcing or crowding beyond its capacity to get the results."

"We would recommend one size larger on any furnace job," say Dunshee Brothers, Chariton, Iowa.

R. S. Thompson, chief engineer of Thompson Heating Company, Columbus, Ohio, says:

"A furnace should be the right size; but the right size is one with a capacity of fifty per cent. in excess of the theoretical requirement."

The Angvick House Furnishing Company, Ashland, Wisconsin, writes in answer to the query:

"A slightly over-size furnace is better (particularly for drafty buildings), for on extra cold days a hotter fire must be kept up—a fire not too hot for the size of the furnace. The result is a burning out of the castings sooner than would otherwise take place."

"Most emphatically, yes, in answer to your query about the over-size furnace," writes C. L. Epps, Van Wert, Ohio. "There is no question of it in my mind. I install all of my jobs with a size larger than the rating calls for."

G. B. Churchill, Galesburg, Illinois, says:

"We always sell over-size furnaces, as they last longer, burn less fuel, and give better satisfaction."

An excellent selling argument in behalf of the over-size furnace is supplied by W. A. Covell and Sons, Waterloo, Iowa, with special reference to rented houses. They declare that an over-size furnace will last twice as long in a rented house—implying, of course, that the tenants who rent the house will not have the same interest in the maintenance of the furnace as the owner would have.

The tenants, therefore, are less likely to take good care of the furnace than the owner, and will crowd the draft on it whenever it falls short of giving the full amount of heat. An over-size furnace does not need any crowding, and, therefore, is less likely to be subjected to improper handling.

In the mind of S. J. Pelz of Clinton, Wisconsin, there is considerable doubt as to the advantage of over-size tires for prolonging of the life of an automobile, but he has no doubt whatever as to the benefit of an over-size furnace in rendering comfort of the householder in all climatic circumstances.

Gus Goebel of Bowling Green, Ohio, says:

"A practical furnace man will not put in an undersized furnace if he expects to hold his trade. On the contrary, he will recommend a size larger than is required for the reason that it will give better satisfaction in extremely cold weather and will save fuel. This, by the way, is a good talking point to a prospective buyer."

There is not the slightest room for question in regard to the matter of oversized furnace, according to Thomas Baird of Baird-Swannell, Incorporated, Kankakee, Illinois. He is firmly of the conviction from experience that theoretical requirements and measurements must be modified to meet the practical needs of each particular dwelling. He knows that a reserve capacity is a big factor in maintaining the good will of the dealer's and installer's customers and that it is of great benefit to the trade to be able to point to the example of a furnace which maintained a comfortable warmth in the householder's dwelling when the thermometer was below zero.

In concluding this review of attitude of the trade toward the use of the over-size heater, it is significant to note that only one out of the many representative dealers and installers expressed himself as being opposed to the over-size furnace. His objection, however, is technical rather than practical. He believes that a furnace which is adequate to all the requirements of the house under all conditions of weather is not an over-size furnace. He prefers to regard it as an adequate furnace.

President Menk of Western Association Outlines Program for 1922 Activities.

R. W. Menk, who was elected president of the Western Warm Air Furnace and Supply Association at its recent annual meeting in Des Moines, in the following statement outlines some of the important matters to which the members of that very "live" organization should give their attention during the coming year:

TO MEMBERS:

Without a doubt every member of our Association who attended the Des Moines meeting came away with greater enthusiasm, and with a firmer determination to carry out the reasons for its existence than at any previous meeting.

The past administrations have laid foundations and set standards which will require the utmost energies of your present heads to match.

Therefore, in order at least to equal our predecessors we want to enlist the limit of your assistance.

In order that a definite understanding may be had of the problems confronting us and that you may help us solve them, the following outline will give you a clearer analysis:

Standardization:

Ways and means of standardizing commodities. Their manufacture and marketing.

Education:

A program of educating the installer and the public in general, in the installation and operation of furnaces.

Membership:

How directly or indirectly to increase same and whom you will solicit; also give us the names of those you think should be with us.

Suggestions:

For improving the Association as a whole. To make our meetings of still greater benefit.

Start Something Hour:

Get set well in advance of our next meeting and come prepared to pull a fast one.

Here is a program that truly requires work and attention to bring about the desired results. A program in which each member can offer his suggestions.

Write us fully upon every subject that appears of especial interest to you and don't be afraid to say what you think, for that is what is making this Association worth while.

R. W. MENK, President.

Chicago, December 22, 1921.

The Warm Air Heater System Requires a Correctly Built and Proportioned Chimney to Be Effective.

The Chimney Is as Indispensable to the Warm Air Heater System as the Transmission Gear Is to the Engine of an Automobile.

Take a good automobile engine and put it in a dilapidated chassis with worn transmission gears, slippery brake drum linings, and with only about 10 per cent of the lubricating oil it ought to have, and you will get some idea of what it means to neglect any essential part of a complete system.

Transmission bears, tires, brakes, lubricating oil, etc., are necessary parts of the automobile system.

Similarly, the chimney and smoke pipe are indispensable parts of the warm air heating system.

The warm air heater itself corresponds to the engine of the automobile.

With proper accessories, the warm air heater performs all the work for which it is intended—and performs it better than any other mechanism devised to produce like results.

But if the chimney is not properly coordinated with the warm air heater, then the warm air heating system falls short of the performance of which it is capable.

There is no denying, therefore, that a chimney adequate to the capacity of the warm air heater is essential to this form of heating system.

While a great deal of research and experiment have been devoted to the warm air heater itself, comparatively little attention has been paid to the chimney as part of the warm air heating plant.

The dealer and installer of warm air furnaces owes it to himself to insist upon the right kind of a chimney in connection with the warm air heating plant which he sells and installs.

The prosperity of the trade depends upon the approval of the public. That approval can not be gained and held unless the warm air heating system gives satisfaction.

An indispensable requirement to the obtainment and maintenance of satisfaction is the chimney.

In new houses the dealer and installer can bring the influence of his knowledge and practical skill to bear upon the owner and builder for the purpose of constructing the proper kind of chimney. In old houses he can, to some extent, persuade the householder to correct the more harmful defects of the chimney.

Definite standards have not yet been determined in such a manner as to gain general acceptance by the heating profession and the warm air heater trade.

The best warm air heater ever made will fall short of delivering the service for which it is built if the chimney is wrongly constructed or is so placed as not to afford the correct amount of draft under all conditions.

The relation between combustion and smoke issuing from a chimney is not as clearly understood as it might be and there are many wrong ideas concerning it.

At the sixth National Exposition of Chemical Industries of New York this year, F. F. Uehling, a combustion engineer of New York City, indicated some significant facts in regard to the loss of heat energy wasted up the chimney.

For instance, he declared that: "That idea that a smoky stack is a sign of waste is not always true. In fact, whether the gases leaving a chimney are smoky or smokeless is no indication as to the efficiency with which the fuel is consumed."

This is a somewhat startling statement and goes against the popular notion of the relation of combustion to smoke.

By way of making this clearer, Mr. Uehling says that: "Steam boilers, connected with a stack that does not show the slightest trace of smoke may burn twice as much coal per pound of steam generated as when smoke is in great prominence."

Continuing, he says:

"Black smoke is unburned carbon, but the amount of carbon in this light and finely divided form that is necessary to give the products of combustion a black appearance is generally only a small fraction of 1 per cent of the actual fuel burned.

"Although it is possible for the loss due to this cause to be serious, it is a fact that the average loss from this source can safely be estimated at less than 2 per cent.

"To minimize chimney losses, the proper amount of air must be supplied.

"This is true whether or not air is mixed with the losses, the proper amount of air must be supplied.

"This is true whether or not air is mixed with the fuel before it is ignited.

"These facts can be determined by flue gas analyses and temperature measurements.

"Stack losses may be determined in this way for the effect of any change in fuel or method of firing.

"When carbon, the principal constituent of any fuel, is completely burned the result is carbon dioxide.

"Complete combustion occurs when air is supplied in excess of what is needed.

"If the air supply is reduced too much there is also a possibility of incomplete combustion.

"When this is the case some of the carbon in the fuel will burn to carbon monoxide instead of to carbon dioxide.

"The large loss in practice is due to excess air and not to an insufficient supply.

"Carbon is the principal constituent of all fuels, if

1 pound of carbon were consumed with the exact amount of air required completely to burn it, the 21 per cent of oxygen in the air used would combine with it and appear as 21 per cent. carbon dioxide in the products of combustion for the reason that oxygen combines with carbon to form an equal volume of carbon dioxide.

"But if the same weight of carbon were consumed with twice the amount of air theoretically required to burn it, only one-half of the 21 per cent of oxygen in the air used would combine with the carbon, the volume of the products of combustion would be twice as much, and the carbon dioxide content only 10.5 per cent."

It must not be inferred from what has already been said that there is not enough precise information at hand to warrant the drawing up of definite rules and instructions with a regard to chimneys and their correct proportions.

The American Society of Heating and Ventilating Engineers is working upon the problem of correct chimney sizes through its research Laboratory in the Bureau of Mines, Pittsburgh, Pennsylvania.

The preliminary report of the committee of the society on "Model Chimney Ordinance" made in July, 1921, is as follows:

"Your committee has held a couple of meetings with Mr. Ira W. Woodson, consulting engineer of the National Board of Fire Underwriters, who is compiling a model ordinance on chimney construction. As a result of those meetings, a number of constructive features were incorporated in this ordinance.

"Since our Research Laboratory is at present investigating chimney sizes, your committee thought it advisable, for the present at least, to postpone taking any action on the table of minimum chimney sizes as recommended by both the boiler and furnace manufacturers' associations of the country.

"Your committee finds that neither the high nor low-pressure engineer has sufficient research data at hand to warrant formulating a comprehensive formula for chimney design. The number of chimney formulae in use are mostly empirical in nature.

"With the object in view of crystallizing our best efforts on this question of draft which is the most important of all factors that determines both the capacity and efficiency of heating and power boilers, your committee begs to submit the following outline of suggestions for the consideration of our Research Laboratory:"

Draft Investigation.

I. INSTRUMENT REQUIRED:

1. Pyrometer for measuring temperatures at several points from the boiler outlet to top of stack.

2. Sensitive draft gauges to measure the pressure drops at several points from boiler outlet to top of stack.

3. Gas analysis machine to determine extent of air leakage along the course of the stack.

4. Barometer, hygrometer and wind velocity instruments for weather conditions.

II. FACTORS TO BE DETERMINED:

1. Different heights of stacks to determine effect of height on draft intensity.

2. Different smoke pipe temperatures to determine effect of temperature on the draft.

3. Different cross-sectional dimensions of stacks to determine effect of area and hydraulic mean on the draft.

4. Different wall thickness to determine effect of heat loss through chimney walls.

5. Different inside surfaces, from smooth to rough to determine their effects on draft.

6. Different construction as to tightness to determine effect o fair leakage at different points along stack.

7. Different stack exposures, whether built inside, or with one to four walls exposed.

8. The effect of humidity, wind and outside temperature on draft.

9. The effect of nearby trees or higher structures on the draft.

10. The effect of different angled offsets and constrictions in the stack.

11. The effect of other connections to smoke pipe or chimney flue.

When one considers the endless number of variables that enter into the draft formula or equation, it can be readily understood why our knowledge of power or low-pressure stack requirements is still in the empirical stage.

III. Define what the engineer means by "draft" or suggest a more specific term.

The main features of the chimney ordinance proposed by the National Board of Fire Underwriters, and approved by the American Institute of Architects, and other interested organizations, were published on page 25 in March 5, 1921, issue of AMERICAN ARTISAN AND HARDWARE RECORD. They are reproduced here for the convenience of our readers:

Section I. Chimney Construction.

1. The walls of chimneys used for stoves, ranges, fireplaces, warm air heating furnaces, low pressure steam and hot-water heating boilers, or other heating appliances, whether the fuel used be wood, coal, oil or gas, shall be built of brick, concrete, stone, or hollow tile of such thickness and construction as is hereafter specified. All chimneys, irrespective of which materials the walls are built, shall be lined with fire clay flue lining or with fire brick. The lining shall be made for the purpose and adapted to withstand high temperatures and the resultant gases from burning fuel.

2. Solid brick or concrete chimney walls shall be not less than 4 inches thick exclusive of flue linings. A standard size brick laid flatwise shall be deemed to fulfill this requirement for brick.

3. Concrete chimneys cast in place shall be reinforced vertically and horizontally to avoid cracks liable to occur from temperature stresses or unequal settlement of foundations. The metal shall be thoroughly embedded in the concrete. Concrete blocks shall be similarly reinforced.

4. Stone chimney shall be at least 4 inches thicker than required for corresponding brick or reinforced concrete chimneys. Rubble stone chimney walls shall be not less than 12 inches thick.

5. Hollow tile shall not be used for the walls of isolated or independent chimneys, but it may be used for chimneys built in connection with exterior hollow

tile walls of buildings not exceeding three stories in height, in which case the chimney walls shall be not less than 8 inches thick. The outer 8 inches of a building wall may serve as the outside wall of the chimney, but the remaining chimney walls shall be constructed of two layers of 4-inch tile set with broken joints; or they may be built of 4 inches of solid brickwork. In either case, the side walls of the chimney shall be securely bonded into the wall of the chimney. No chimney shall be corbeled from a hollow tile wall.

10. Fire clay flue lining shall be of standard commercial thickness, but not less than ¾ inch, and without collars. The flue sections shall be set in mortar of quality above specified and shall have the joints struck smooth on the inside. The masonry shall be built around each section of lining as it is placed, and all spaces between masonry and linings shall be thoroughly filled with mortar. Flue linings shall start at least 4 inches below the bottom of the smoke pipe intakes of flues, or from the throat of fireplaces and shall be carried up continuously the entire heights of the flues, and at least 4 inches above chimney top to allow for a 2-inch wash, and a 2-inch projection of lining. The wash or splay shall be formed of a rich cement mortar or of tile or iron coping made for the purpose. To improve the draft the wash surface should be concave wherever practical.

12. Not more than 2 flues shall be permitted in the same chimney space, and the joints of any two adjoining sets of flue linings shall be offset at least 7 inches. When there are more than 2 flues in a chimney, each third flue shall be separated from the others by a smoke-tight withe or division wall of brick or concrete at least 3⅞ inches (standard brick size) thick and bonded into the sidewalls. Each flue intended for a heating furnace or boiler connection, or for a fireplace, shall be separated from other flues by such a withe. In hollow tile chimneys, the withe may be of tile.

14. Chimneys shall be built at least 4 feet above flat roofs, and 3 feet above the ridges of peak roofs, and shall be properly capped with stone, terra cotta, cast iron, concrete, or other approved material.

17. When coal, wood or oil is used for fuel the minimum area inside of chimney flue lining for warm air furnaces, low pressure steam or hot water heating boilers, and fireplaces shall be not less than 75 square inches, for stoves and ranges 49 square inches, and for small gas stoves or heaters 10 square inches.

18. Smoke pipe intakes to flues shall always enter the chimney through the side and shall be made of fire clay or metal thimbles securely set in the chimney wall with mortar or be cast in concrete. Such openings shall be at least 18 inches below wooden lath and plaster or other combustible ceilings, or open joists. The intake pipe shall not project into the flue.

19. All flues leading from cellars or basements shall have proper metal cleanout doors below the smoke intakes.

20. After a chimney has been completed, all flues shall be thoroughly cleaned and left smooth on the inside.

21. All flues to which heating furnaces or boilers are connected shall be subjected to a smoke test before acceptance, but the test shall not be made until the mortar has thoroughly hardened. The method of test is to build a smudge fire at bottom of the flue and while the smoke is flowing freely from the flue, close it tightly at the top. Escape of smoke into other flues or through the chimney walls indicates openings that shall be made tight before the chimney is accepted. The test shall be made by the contractor in the presence of the building inspector or other official having jurisdiction, and of the owner or his representative.

IV. Area and Heights of Chimneys.

To secure the most satisfactory draft conditions, the area and height of a chimney should be proportional to the number and size of heating appliances attached to it. A poor draft is a great annoyance, and is difficult to remedy after a chimney is built.

A round flue will give a better draft than a square or other rectangular shape having the same cross-sectional area. Round flues are recommended where it is practical to obtain them, but when round flues are placed inside rectangular chimney walls, care must be exercised to insure complete filling of the corner spaces.

Special Fire Pot Makes Soft Coal As Productive of Heat as Hard Coal.

The United States Government declares that soft coal contains within 6 per cent. as much heating power as hard coal, and would be just as valuable for heating if the gas could be burned. Its statistics show:

"A bushel of hard coal contains 6 per cent. volatile carbon or gas, 82 per cent. fixed-carbon or coke, making 88 per cent. heating power.

"A bushel of soft coal contains 38 per cent. volatile carbon or gas, 44 per cent. fixed-carbon or coke, making 82 per cent. heating power.

In ordinary furnaces it has never been possible to burn the gas of soft coal, and the greater part of its heating power has been lost.

The fire pot with which the Heckler warm air furnace, manufactured by Heckler Brothers, Pittsburgh, Pennsylvania, is equipped, is said to be constructed specially to burn all the gas, the smoke, the soot of soft coal, making it as valuable for heat as hard coal.

Perpendicular flues extend from the bottom to the top, and completely surround the fire pot on the outside. These are connected by narrow slots with the inside. The air which is admitted through the draft door is drawn up the flues and discharged through the slots against the sides of the coal; the heat frees the gas from the coal, which immediately mixes with the air and bursts into flame. The smoke passing out of the chimney is white, showing that all the heat-giving qualities in the coal have been consumed. The fire burns around the sides of the fire pot, and gradually consumes the coal towards the center. There are no ashes between the fire and the pot, so that a great heat radiates through the fire pot and dome, thus giving thoroughly efficient service.

Fan Blower Unit Type of Warm Air Furnace Opens Up Great New Field.

Thousands of Factory, Loft and Storage Buildings Can Now Be Heated and Ventilated Effectively at Low Cost.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by F. R. Still, Vice President of American Blower Company, Detroit, Michigan.

There are numberless stores and lofts in every city which have no heat or ventilation; this omission is due to many things; sometimes it is the great expense necessary to install an adequate plant; at other times it is because of the lack of space to install a suitable plant without seriously encroaching upon the rental space; again it is because of the difficulty of installing it in the building on account of the plan or the construction of the building or it may be owing to the use being made of the space or the possible interference with or the discommoding of the tenants in the same or other parts of the building. Whatever may be the reason for the building being unheated or improperly ventilated, the owners of such buildings all realize that sooner or later they must do something to improve the buildings in that respect or they will lose their tenants or be forced to accept very much lower rentals than is obtainable for modern buildings in the immediate vicinity which have adequate heating and ventilating plants.

Figure 1.—Direct Fired Unit Heater Ready for Attachment.

Besides stores and lofts for rental purposes, there are many factory buildings having no steam plant, the power for manufacturing being supplied by some public service corporation. This is particularly true of foundries and warehouses, public garages and temporary buildings. Admitting that there are reasonable grounds for not installing a steam plant in such buildings, then about the only other way to heat them is by stoves, furnaces, gas heaters or electric radiators, but all of them have objectionable features for commercial buildings, among which may be mentioned the following:

Stoves are a nuisance; they are dirty, occupy valuable floor space; overheat the area in their vicinity and fail to heat the more remote spaces; they add to the fire risk and are wasteful of fuel.

Furnaces, having no means for circulating the warm air other than by gravitation, must be placed beneath the floor of the building or the rooms they are intended to heat. Most of the buildings of the type mentioned hereinbefore have no basements beneath them.

Gas heaters are bad because they consume so much oxygen from the air and besides they invariably give off a disagreeable odor. They are dangerous on account of the possibility of an explosion and they are costly to operate as compared with heat obtainable from a good plant that burns coal.

Electric heaters of any type are very costly to operate as compared with any other kind of a heating plant, except in a few places in the extreme western country, where current is obtained from water-power stations, some of which just at present are taking on the heating of buildings so as to get a better load factor to help pay expenses while a regular commercial and lighting business is being built up.

All this points to the fact that something different is required than any of the familiar types of heating and ventilating apparatus; something that is cheap in price, not costly to install and which is simple and economical to operate. Any make of the ordinary house heating furnaces avoids most of these objec-

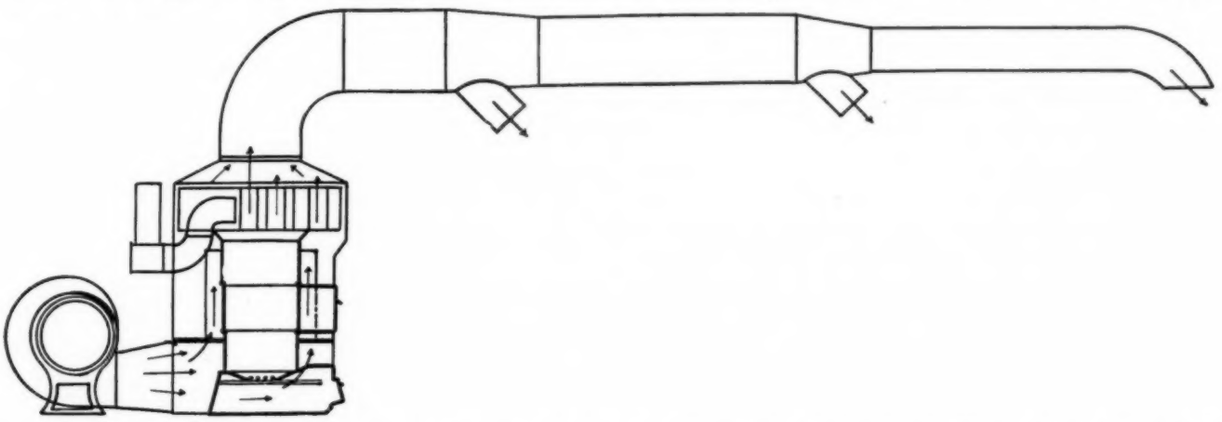


Figure 2 Shows How Direct Fired Heater Can Be Attached to Conduit for Conveying the Warm Air to Any Part of the Building Which is to Be Heated.

tions and fulfills the foregoing requirements excepting the necessity for a space beneath the room to be heated, also the distribution of the heat through long horizontal ducts. If the space to be heated happens to be the ground floor it will sometimes be very difficult and perhaps impossible to provide a space beneath the first floor. Then again, most of the buildings cited above are of such dimensions as to preclude the possibility of distributing heat to all parts of the building from a central point by gravity circulation alone; and as a multiplicity of units only further complicates the objections already mentioned, something besides the furnace must be provided.

The best way to make a furnace a positive and effective heating unit at all times and under all conditions of service, is to put on some kind of a mechanical attachment to cause a positive circulation of air having a capacity to handle *all the air the furnace can heat,* and at the same time be powerful enough to overcome the frictional resistance of the furnace and the distributing ducts.

The most efficient attachment for this purpose is a centrifugal blower of the right type, size and speed; it has no equal for positive and effective results. It is simple, clean, quiet, durable and efficient. It is easily attached to a furnace or to a system of ducts. It occupies little space, presents no fire risk or liability of personal injury.

If the foregoing analysis of the situation is correct, then the combination of a good furnace and blower provides a means to heat and ventilate an extensive class of buildings so far unprovided for. Such an apparatus can be located any place where sufficient space is available and where it is most convenient for coal to be brought in and ashes removed. The ducts for conveying the warm air can be of almost any desired length or form according to the design and construction of the building. No basement or excavated area is needed. The apparatus can be set on the floor of any story or on the roof or suspended from the roof or ceiling if necessary. The air can be forced downward just about as easily as upward and can be discharged at any velocity desired. There being nothing to freeze up or burn up, and nothing but the journals of the motor or blower to lubricate, it can be shut down and neglected for long periods without anxiety or disaster. No engineer, licensed fireman or electrician is required to operate the plant.

Several concerns have attempted to market such a combination but owing to the poor design, badly proportioned elements and inadequate capacity, none of them have made a success of the business. Some furnaces are better adapted to blower attachment than others as the heating surface is better arranged and better proportioned to the grate surface. Others have either too much or too little space between the fire box and the jacket. The dome above most furnaces is not properly designed to get the most effective results whether or not a blower is attached.

After canvassing the market, the No. 6—30 furnace, made by the American Foundry & Furnace Company, was selected to which was attached an American Blower Company's Sirocco Fan and a long series of careful experiments were conducted to learn just what results could be obtained, with various drafts, quantities and qualities of fuel, various volumes and velocities of air and with a variety of hoods above the crown of the furnace for directing the flow of warm air. Any furnace could have been used, but the one selected possess certain features which recommends it to us in preference to many others that were devoid of those features.

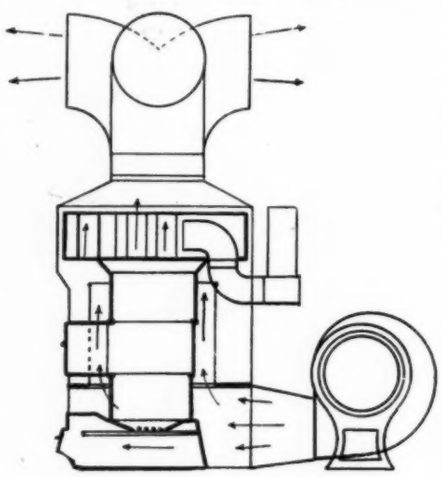


Figure 3 Shows How a Two, Three or Four-Way Outlet Can Be Used.

After these experiments were completed and carefully analyzed, a standard size and combination was made up. The only variable is the type of bonnet on top of the furnace to fit the air distributing outlet or ducts which are best suited to the building where the apparatus is to be installed. A va-

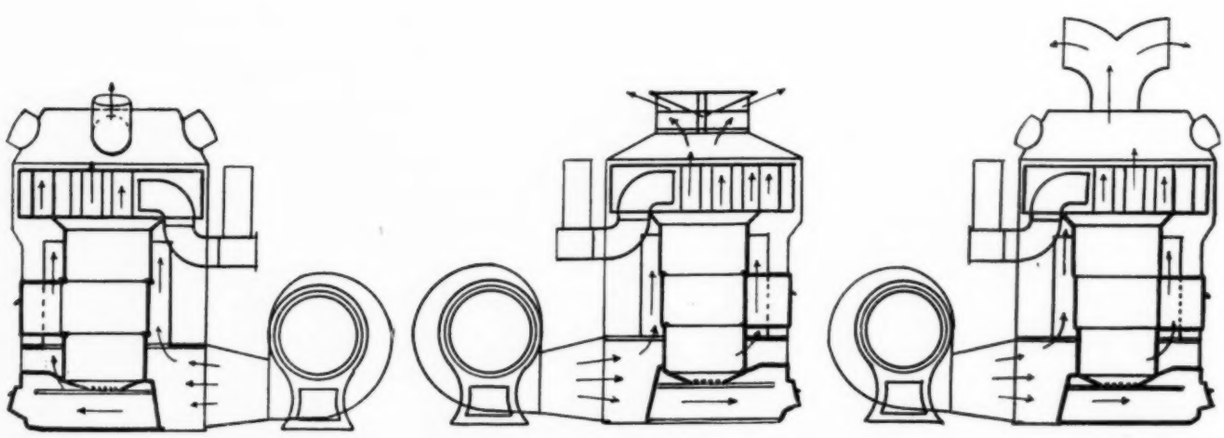


Figure 4 Shows Deflecting and Diffusing Cone Above Outlet Collar. Figure 5 Shows Standard Type of Casing Bonnet. Rigure 6 Shows Combination of Arrangements as Typified in Figures 3 and 5.

riety of standard forms of bonnets and outlet collars, hoods and elbows have been designed, sufficient to meet all ordinary demands as shown in the diagrams.

Figure 1 is a half-tone of the complete unit, ready for the attachment of a 28-inch conduit to convey the warm air to any part of the building which is to be heated. This is known as Arrangement Number 130. and is illustrated by Figure 2, which shows how the duct can be attached.

Figure 3 shows how a two, three or four-way outlet can be used. In this case, if there are two conduits, each should be not less than 20 inches in diameter. If there are three outlets, each should be a 16-inch diameter and if four outlets each should be a 14-inch diameter. This is known as Arrangement Number 430.

Figure 4 shows a deflecting and diffusing cone above the outlet collar to direct the flow of warm air radially throughout the complete circumference of the furnace. This is known as Arrangement Number 230.

Figure 5 shows the standard type of bonnet with numerous short collars attached to the truncated cone similar to what is usually employed in house heating plants. There can be a variety of the number and sizes of these collars to suit the requirements. This is known as Arrangement Number 530.

Figure 6 shows a combination of Arrangements Number 430, Figure 3, and Number 530, Figure 5, wherein most of the heat is discharged into the main portion of the building, with some of it conveyed by separate small ducts to some small rooms partitioned off from the main part of the building.

These arrangements are by no means all that are possible, but they are sufficient to meet almost every requirement and cover all the standard attachments which the makers are prepared to furnish promptly.

The furnace will burn coal, coke or wood and it can be arranged to burn gas if desired. It affords the maximum transmission of heat. It is simple, low in cost, very efficient, cheap to operate and to maintain, and is backed by an unqualified guarantee.

When desired, special blowers can be furnished for direct attachment of alternating current motors. Standard outfits are for belt-drive as the cost is very much less and they are easier to install.

The diameter of the furnace jacket is about 5 feet 2 inches and the height about 7 feet 2 inches. The floor space occupied by the furnace and blower is about 8 feet 6 inches by 5 feet 2 inches. If such a connection is used as is shown in Figures 1 and 2, the available height must be about 10 feet 6 inches.

Either outside air can be drawn in by the blower and heated by the furnace or air from the inside of the building can be recirculated; the latter is much more economical in cold weather, if the ventilation requirements will permit it.

In summer the blower can be used alone for circulating cool, outside air which has a very refreshing effect on the occupants of the building when it is close and sultry.

The capacity of one of these units is 5,000 cubic feet of air per minute and the delivery of 600,000 B. t. u. per hour. A 3 horse power motor will drive the blower to its maximum capacity.

It will be noticed that this is arranged as a "blow-through" outfit, instead of a "draw-through," as so many other combinations have been and still are being made. The advantage of a "blow-through" combination is this:

1. The blower handles cooler air; as air expands with the rise of temperature rises, it becomes lighter; hence to deliver a specified quantity of heated air in a given unit of time, the blower does not have to run nearly so fast when handling the cooler air. Further it avoids the heating of the bearings and possible misalignment due to expansion.

2. Even more important than the effect on the blower is the avoidance of coal gas, ashes and dust getting into the air. When blowing through the furnace, the entire heating surface is enveloped in air under compression; whereas, the opposite is the effect with a "draw-through" arrangement. In the latter case a partial vacuum is produced in the space between the furnace and the jacket, which super-induces the tendency for gases, soot and ashes to leak into the air passages through every crack and crevice in the furnace. It is more often the rule than the exception for the vacuum in the air passages to amount to anywhere from five to twelve times the amount of the chimney draft; hence the argument so generally made that "there can be no leakage outward because the strong chimney draft will cause a leakage inward," is not true. It has been found that about the maximum draft which can be applied to a round fire-pot furnace is 2/10 inch water-gauge. This produces such an intense heat as to be dangerously near the point of melting some parts of the furnace. To work a furnace regularly under such temperatures as this draft will produce, shortens its life very rapidly. Now it is not at all uncommon to encounter a frictional resistance to the flow of air equal to one inch water-gauge and sometimes it is as great as 1¼ inches in furnace installations of this type. Therefore, it is easy to see which direction the gases are likely to go through the leaks with a "draw-through" combination, as air and gases always take the course of least resistance.

Another advantage gained with a "blow-through" combination is the increased transfer of heat by that method of circulation. It has been conclusively demonstrated that the heat transfer increases with the frictional resistance to the flow of air. In other words, the air being under compression absorbs more heat than it does when rarefied. Therefore, the effectiveness of the heating surface is enhanced to a very considerable degree.

Five thousand cubic feet of air per minute is sufficient to change the air every 20 minutes in a building having 100,000 cubic feet of space or every 15 minutes in a building having 75,000 cubic feet of space. A room 60 feet wide by 12 feet high and 140 feet long has about 100,000 cubic feet of space, or 75,000 cubic feet if 100 feet long. Such a building, when built of ordinary construction, can be heated to a temperature of 65 degrees to 70 degrees Fahrenheit with one of these outfits, when the outside temperature is zero.

The weight of the complete unit is less than two tons, or under 100 pounds per square feet of floor

area. An experienced furnace setter with a helper will easily assemble four of these units in a day of eight hours. The time required to put up the outlet connections and the ducts varies with local conditions, ranging from one hour for Figure 4 to as much as a day for an extended duct system on some such a plan as shown in Figure 2.

This system is not recommended for residences. It is primarily for commercial institutions, for which it has no equal in efficiency among any of the direct fired unit heaters produced.

Professor Willard Reports on Research Work Done Since September First.

Secretary Allen W. Williams, under date of December 29th, forwarded to this office a report by Professor A. C. Willard, who is conducting the extensive research work on warm air furnace operation at the University of Illinois, under the auspices of the National Warm Air Heating and Ventilating Association.

Referring to the report, Chairman Dougherty of the Advisory Committee writes as follows:

"This report of Professor Willard fully explains itself. It marks the second milestone in our progress in establishing the furnace industry on a sound engineering basis. The first milestone marks the establishing on a sound engineering foundation of reliable methods of determining how to measure both the weight and temperature increment of the air passing through a warm air furnace. Having developed and laid the scientific foundation, this report gives us the first reliable application of those engineering principles to the actual development of the art of furnace construction.

"We as manufacturers are more vitally interested in the art of furnace construction than in the scientific aspect of the subject. In order, however, that the are of furnace construction and design shall move along proper lines, it is absolutely essential that we understand the underlying scientific principles."

The report follows:

"The program adopted by the Advisory Committee at its meeting of June 18th held in Urbana is being followed out in detail.

"1. Seven tests have been run on the 52-inch *unlined* casing. This completes item Number 1 of the program which is : I. Run present plant with a plain galvanized iron casing (unlined) using the most efficient type of recirculating duct.'

"2. Performance curves for the above tests have been plotted similar to those shown for piped furnace Figure 6, page 21, Bulletin Number 120. As the same furnace was used in the first set of tests with a black iron lining as shown in Figure 5, Bulletin Number 120, these new curves are directly comparable with the curves shown the in the Bulletin, and indicate a great reduction in efficiency at a given combustion rate for the unlined casing. These values show reductions in efficiency of 10 to 12 per cent, at combustion rates above 4.5 pounds per square foot grate per hour.

"3. A comparison has been made between the recirculating duct used in previous tests as shown in Figure 3, page 18 of Bulletin Number 120, and the improved type of duct, Figure 17, page 55, Bulletin Number 120, used in the seven tests just completed. This comparison shows an increase of about 25 per cent in capacity, at a given register temperature, for the improved duct. This demonstrates conclusively the necessity for correct recirculating duct design.

"4. Complete study of radiating losses has been made on these seven tests, as reported for a pipeless furnace. See Figure 59, page 106, Bulletin Number 120.

"5. Additional data on heat loss and temperature drop in leaders under actual test conditions have been obtained. These data show an average loss of about 3 degrees Fahrenheit per running foot of ordinary asbestos covered leader pipe.

"6. Data were obtained and a study of castings temperatures for the pipe furnace is in progress, for the seven tests.

"7. Additional tests on the piped plant with fan device are in progress."

New York Heating Engineers Discuss Humidification of Homes.

A lively discussion of home humidification gave special interest to the meeting of the New York Chapter of the American Society of Heating and Ventilating Engineers held on Monday evening, December 19. President A. S. Armagnac called the meeting to order, and Secretary J. E. Bolling reported that fourteen members had been added to the roll.

The president introduced Charles Whiting Baker, who spoke in some detail of the equipment that he put into his house to get a greater humidification in the air. Originally it had been a twin furnace system and later one of the furnaces had been replaced with a steam boiler to meet some exigencies. His home had a conservatory of considerable size that was heated from the furnace, the air being discharged into a brick chamber so constructed as to allow a considerable surface to be presented in evaporating pans over which the air must pass. The humidification was sufficient to put frost on the windows of the conservatory in extremely cold weather.

Frank J. Douglas was then introduced by President Armagnac, stating that Mr. Douglas had brought as credentials from the Illinois Chapter a receipt given to his father, Thomas J. Douglas, one of the charter members of the society, by Justin A. Goodrich for organization expenses. It was dated October 16, 1894. Mr. Douglas pointed out the desirability of greater humidity in homes and when he started in to study the subject he found little to guide him.

J. Coggeshall then stated that he was the substitute for Dr. Jonathan Wright, who has done a great deal of experimenting with humidification in hospitals. He pointed out that with a special sloping bottom pan connected underneath a radiator so that the steam supplied to the radiator could be connected under the pan, and the connection to the radiator would be to the other end, evaporation was secured which had been found very gratifying in hospital work.

A man's character is of more importance than his parentage. He is what he makes himself.

The Householder Judges the Warm Air Heater by Its Effect upon the Coal Pile and the Thermometer.

Greenberg Urges Competing Dealers to Get Together and Cooperate on the Service Features of the Warm Air Heater.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by J. C. Greenberg, Cleveland, Ohio.

This is the season of the year when warm air is really a blessing to the people. This is the time when we should get our heads together and see what can be done toward furnishing it—not merely talking it.

There is not much that I can say about installation of warm air furnaces because I am not an installer. I know very little about the mechanical end of it.

I fully realize, however, that before a furnace can be installed it must be sold. On this point I am certain that we will agree. It is like having rabbit pie. First we must get the rabbit. So this being the case, let us get the rabbit—the sale.

Let us look at it from the buyer's point of view, and see how he sees it when he goes into the market to buy a heating plant.

First, the buyer knows nothing at all about a heating system. All he knows is that he wants a plant that will do the job in zero weather. He wants heat.

He wants warm air when it is cold. He cares nothing at all how it is made to serve, but he does know that it must serve.

The buyer of a warm air plant has two views of the proposition. One is the coal pile, and the other is the thermometer.

That is all the proof he wants, and can understand. For that understanding, he is willing to spend his money.

Now, then, he goes into the market to buy warm air. He has no choice, and is at the mercy of the man who explains it to him. What happens?

He becomes confused with British thermal units, circulation, air pressure, exposure of his building, and a lot of doubt. It is an awful job to buy a furnace at any time.

Each dealer has a different type of furnace, and each dealer has a different argument about the same thing—namely, warm air. One would hardly imagine that so many different kinds of arguments could possibly be invented on the same topic.

The result is that after days of arguments, and explanations he becomes hopelessly lost, and the plumber gets a job putting in a steam heating plant. The poor confused customer is convinced by one man about a pipe furnace, and then some other dealer tells him that he is all wrong; that he needs a furnace without pipes. One talks about a steel furnace, and another tells him about cast iron, and so on it goes till he runs afoul of the plumber and all is off.

The reason for all this confusion is that there are too many kinds of furnaces doing the same thing after all. It means coal pile and thermometer in the end. What is the answer? What can we do about it?

Most of the householders of this country are not interested in the purely technical details of the construction and operation of the warm air heater.

The average person who goes to a physician for treatment does not inquire into the method of diagnosis and the intricacies of pathology. He is satisfied with treatment if it produces the right results.

The people want service when they buy warm air heaters — service in zero weather as well as in milder weather.

Warm air heater dealers and installers can promote the general welfare of the trade and serve the public best by emphasizing the superiority of the warm air heating system rather than by competing with one another in their advertisements and contradicting one another to the confusion of the public.

In my estimation, we sheet metal men who handle furnaces are not on to our business. We believe in our goods as we should, but we do not stop to think how to merchandise it—how to sell it and get the money for our furnaces.

To state this in a more simple manner, we are really not selling furnaces at all. We are selling the service that a furnace should render.

To illustrate this point, let me ask you this one silly question. If you had a car load of furnaces on your floor, would they heat your store?

No. They would not. You must use one furnace properly installed to get good comfortable heat. Therefore, unless that furnace is made to serve, it is not useful. Again, this being the case, we are in reality selling warm air home made.

We all advertise a little. We all play for five-inch space, or maybe fifty inches space in the paper for advertising a certain brand of furnace. In the same paper, there are half dozen of different advertisements telling a story that refutes your own.

Every dealer has a different argument, and when the prospective customer looks at the paper, he becomes dizzy. Each dealer disputes the other dealer. Each dealer tells the prospective customer that his furnace is the best, and there you are. What can the would-be buyer do in self-defense?

There is an answer for everything, and for this also. Here is something to think about.

Suppose you, Mr. Sheet Metal Man, spend ten dol-

lars a week for advertising space, and each one of your competitors spends an equal or higher or lower amount for space to tell about a furnace. Does it not become apparent that you all spend money to contradict one another? Why should this money be spent so foolishly?

Now, then, let us reason this out along the line of business logic and see where we wind up.

First, we are selling service called warm air.

Second, we all claim to produce the same result—heat.

Now, then, why don't we all in each town get together on a business basis and say something like this:

"Instead of us all spending a little dribble for space and only getting a few inches of publicity, we should in this town create an advertising campaign and advertise warm air. Let us all take a full page and advertise the service we have to sell. Let us stop selling names and brands. They mean nothing in the minds of the public. They all know what warm air is, so let us all together and advertise warm air service."

If this is done consistently, each dealer in a town will get a large advertisement for little money. He will get large publicity for little cost and give the public a better understanding about warm air.

If the customer comes in, you explain to him about your furnace, but he has no other confusing or negative thought whatever about other furnaces. You have a better chance to sell him on the jump. It is better business psychology.

In any manner of thinking, I can see no advantage of having one dealer tell the public one thing, and another dealer tell them something different about the same kind of service.

Of course, you may argue that your furnace is different, that it works differently, etc., but after all, the desired result is the same.

No matter what our selling talk may be after we get the customer into our place, the incentive, the motive of the customer and the dealer is to buy and to sell warm air service, and that is what we should advertise.

Consistent and cooperative advertising will do the trade a lot of good, and give the customer a clear line of thought along the line of warm air.

I feel positive that if we sheet metal men who handle furnaces would get together and advertise our service instead of advertising our wares the results would be better and of no more practical use to the public.

Merchandising furnaces does not mean as much to the customer as merchandising warm air. If we want to sell a certain service, we must talk that service. If we have a certain benefit to sell, we must advertise that certain benefit.

In our line we must, if we want to succeed, give the public a clear conception of what they are looking for, which in this case is warmth and comfort.

Advertise it.

Educate the public along the line of results not how to construct a furnace.

You can not expect the public to learn construction and technical analysis.

Advertise warm air and create a demand for it.

No dealer can contradict warm air, but he can contradict other furnaces with the one he sells.

Let us bear in mind that warm air heat is what the customer needs, and will have if made to properly understand it.

After all is said and done, warm air is what they are after, not size, form, or proportion.

The customer is interested in actual results not theory. Talk warm air. Advertise it. Sell it.

Use Plain Simple Word in Your Selling Talks.

The English which we use every day does not contain the special terms of the different trades.

"British thermal units" is an expression which the housewife never employs when she is talking about the warm air heater.

"Charcoal sheets" are words heard once in about a hundred years in the average grocery store.

To put the matter differently, when dealing with the general public it is wise to avoid the use of terms which are not generally understood.

The householder who buys a warm air heater knows little or nothing about glass surfaces as a cause of heat losses, anemometer, calibration, radiation, convection, and similar words and phrases.

What he wants is a warm air heater which will keep his home comfortable in all kinds of weather.

Therefore, in selling warm air heaters, the most successful argument is the argument based upon dependable service and comfort.

Bear in mind always that the average person outside your trade does not understand its special words.

Watch your language, then, and don't let technical expressions creep into your selling talks.

Get Your Business Before the Biggest Number of People.

Now and then one hears a description of an article by some enthusiast to the effect that "it sells itself."

Possibly, there is a grain of truth in the assertion, but it should not mislead the man of business into lessening his efforts of salesmanship.

If you want to sell warm air heaters you will have to do the talking yourself—either by word of mouth or by persuasive text of advertisements and direct by mail circulars and booklets.

In turn, salesmanship depends upon gaining the attention of a sufficient number of prospective customers.

This resolves itself the work of getting your business before the largest possible number of people in your territory.

You can stand on the corner of the busiest street in your town and whisper in the lowest tones of which you are capable that you have a good reliable warm air heater for sale. Keep on whispering during business hours from now till Gabriel blows his horn and you may sell one or two warm air heaters in this manner. But if you want to do a big volume of business you have to speak right up to the folks.

Estimate Blank Helps To Avoid Losses.

A Place for Every Item of Cost Should Be Provided.

In figuring out estimates for warm air heating installations, it is necessary that the contractor has a well defined outline of the work he is to perform—both the work which can be done in his shop and the work that must be done on the premises where the installation is to be made.

A very important part of such an estimate is that pertaining to the material that is used—whether this happens to be ready made, or must be made to order for the specific job.

For the assistance of their dealers, the Haynes-Langenberg Manufacturing Company, St. Louis, Missouri, have designed an estimate sheet for this purpose, as shown in the accompanying illustration.

It will be noted that each class of material is kept separate. First, all the tin pipes, with boxes, boots and elbows, wall stacks and offsets. Then the registers. Next, the register faces, wood or cast iron. Then the smoke pipe, with its elbow and "Tees." Next, the cold air pipes, elbows, flanges, shoes. Then collars, draw bands, dampers, etc.

The warm air furnace, with its casing, asbestos paper and paste, ends the list of material items, after which comes the labor cost—in shop and on the premises.

The final items are such as freight, railroad fare and hotel bills, etc.

If proper care is taken to include every item that enters into the cost, the installer should have no trouble in arriving at an accurate estimate of what the job will cost him.

Form 64 10M 10-21 McM

MATERIAL ESTIMATE FOR

"FRONT RANK" HEATING SYSTEM

FOR _____ DATE _____

AT _____ PLAN NO. _____

STYLE OF BLDG _____ MATERIAL _____ ORDER NO _____

	COST	AMOUNT		COST	AMOUNT
Warm air Pipe, Tin			Forwarded,		
			Smoke Pipe		
			Smoke Pipe Elbows,		
Warm air Elbows, Tin			Smoke Pipe Tees,		
			Cold Air Pipe,		
			Cold Air Elbows,		
Boxes,					
			Cold Air Flange		
Boots,			Draw Bands		
			Cold Air Shoe		
			Collars,		
Wall P.					
			Dampers,		
Offsets,					
Total of List Prices			Total of List Prices		
Less % Discount			Less % Discount		
Net Total			Net Total		
Registers,			Thimbles,		
			FRONT RANK Furnace,		
			Furnace Casing,		
Total of List Prices			Asbestos Paper,		
Less % Discount			" Paste,		
Net Total					
Register Faces			Price F. O. B. St. Louis,		
			Hrs. Labor, Tinner,		
			" " Helper,		
			Freight, Class, Rate,		
Total of List Prices			" " "		
Less % Discount			R. R. Trips,		
Net Total			Board,		
Forwarded,			Price Installed,		

Discount on Tin _____

" " Galvanized _____

" " Registers _____

" " Faces _____

" " Furnaces _____

Figured by _____ Allowance _____

Discount Sheet No. _____ Bid submitted $ _____

Excellent Form for Figuring Cost of Warm Air Heater Installation.

When he has worked out this final figure, it is up to him to sell his installation—and here his reputation for doing good work will in most cases enable him to obtain a better price for his work than the man who has no such reputation.

To this figure, he must, of course, add his regular overhead and the percentage of profit without which he can not afford to perform the work.

Real Cooperation in Sales Campaign Always Increases Business for Installer and Maker.

Many Manufacturers See Wisdom of Close Cooperation with Dealers in Selling Efforts.

Many manufacturers of warm air furnaces and fittings have found it good policy to prepare ready-to-use advertisements as a part of their cooperative service for their dealer-installers.

We show in the following pages examples of such advertisements. They have been chosen from a large number submitted to us for comment and we are pleased to note that in every case great care and much thought must have been expended in the preparation of these advertisements.

It is also worthy of mention that every manufacturer who has "sold" his representatives on the idea, so that they have been able to sell the same idea to their customers among the dealer-installers, is able and pleased to acknowledge that these ready-to-use advertisements have been of material assistance in centering the attention of house owners and prospective home builders on this particular type of residence heating—the only real healthful method—heating by means of warm air.

It is not our purpose, at this time, to criticize or to compare the various exhibits of these very helpful advertisements, the only reason for showing samples of them in this, our 1921 Warm Air Heater Special, being that we want to emphasize the fact that when manufacturer and dealer-installers cooperate in such an efficient manner the entire warm air heating industry can not but help derive much benefit.

And the greater use the dealer-installer makes of this liberal service rendered to him by the manufacturer, the greater will be his own sales, the faster will his business and profits grow, and the more will the idea of the Warm Air Furnace as a really successful means of heating and ventilating residences and other buildings suitable for such an apparatus become established among those from whom the profits must come—the present and prospective home owners.

To accomplish this four-fold object, the dealer-installer who is not at this time committed to the policy of consistent advertising must change his ways and decide upon setting aside a certain amount—a certain percentage of his sales, if you please—for newspaper or circular advertising.

He can no longer afford to trust to his "reputation for doing good work."

There are others who are building up a reputation as efficient warm air furnace installers, and in the last analysis it will be the man who hits the prospect most often and with the most telling sales arguments—by

A 5-Year-Old WEIR is a Youth
A 10-Year-Old WEIR is In Its Prime
Many 30-Year-Olds are Still on the Job and Performing as Well as In the First Year
THOSE are facts that can all be proven by dozens of instances. The WEIR all-steel gas-and-soot-consuming furnace DOES stand up—and it does save coal every year of its life—and nothing but severe abuse will reduce that life to less than thirty years or more.
Any mechanical device, whether it be an automobile or a washing machine, can be so mistreated that it will not serve as long and faithfully as its maker intended. But that is not the fault of the machine or the maker.
WEIR furnaces, if given a chance, WILL LAST FOR THIRTY YEARS or MORE and SAVE COAL EVERY YEAR THEY ARE USED.
You Can Buy Individuality in Your Furnace as Well as in Clothes
FURNACES are like clothes—they must be made to fit each particular building and cannot be installed in a hit or miss fashion as might be supposed.
Each home or other structure presents individual problems that must be properly solved or that furnace will never give real satisfaction. Proper installation has as much or more to do with the way a furnace performs as does the way the furnace itself is made.
To insure perfect installations the Meyer Furnace Company sells only to the choicest authorized dealers and installers; and in addition to that they maintain a highly efficient Engineering Department at the plant where all installation problems are carefully gone over by experts.
This department is maintained for the free use of WEIR installers and dealers to insure perfect and lasting satisfaction to WEIR users
The WEIR is made by the Meyer Furnace Co., Peoria, Ill.
The Principle of a Warm Air Furnace
BECAUSE so many people believe that a warm air furnace is an intricate and almost mysterious device, we feel that a word concerning basic principles of warm air heating will be of benefit.
A warm air furnace is simply a heating unit or stove set in a casing or sheet metal drum in the basement. Large pipes lead from the rooms to the lower part of this drum and several warm air pipes lead from near the top of the drum to the rooms to be heated.
Cold air, being heavier, descends the the large cold air pipes, is then heated in the space between the furnace proper and the casing, becomes lighter and ascends thru the warm air pipes to the rooms to replace the air drawn down the cold air pipes.
The different factors entering into the construction and complete installation of a warm air furnace are many. The correct size of the grates, the size of the casing, the proper construction of the heater to guard against leakage of gas and smoke into the living rooms, proper moisture and correct location of cold air and warm air pipes all count and influence the fuel consumption.
We propose to bring to your attention details of construction of the WEIR and to prove conclusively that thirty-five years of experience has enabled the WEIR makers to reach perfection in furnace making.
The WEIR is made by the Meyer Furnace Co., Peoria, Ill.
Arc or Ox-Acetylene Welded Joints are Found in the WEIR
JOINTS welded by electricity or oxygen and acetylene gas actually fuse the two pieces of metal into one. Both of these up to date processes are used in the new factory in eliminating what has also been an objection to warm air furnaces—leaking joints.
R furnace is positively gas, moke tight and if this as- of the value to you that it o thousands of other WEIR ould convince you that the nace is the heating plant for rchase and thus avoid the ting possibility of ruined walls, pictures, etc.
Gases or soot simply cannot come from the WEIR as it is built today, and then pass thru the registers into the rooms and the materials in the WEIR stand up and continue to save fuel money many years after the price is forgotten.
The WEIR is made by the Meyer Furnace Co., Peoria

Figure 1.—Samples of Ready-to-Use Advertisements Furnished by Meyer Furnace Company, Peoria, Illinois.

personal solicitation and with consistent advertising—that brings home the bacon in the shape of an order for the installation.

The old saying that "satisfactory service is the best advertisement," is only half true, and in most cases it is not even half true, for between two good installers, the one who advertises consistently will always get the bulk of the business, and in many other cases the installer who does only mediocre work but who sees the wisdom of regular advertising will often secure the job which the expert might have obtained if he had been willing to advertise.

There is really little excuse for any warm air furnace installer not advertising, for if he can not prepare his own advertisements he can in practically every case secure the necessary assistance from the manufacturer whose warm air furnace he sells.

The main point, then, is to make up your mind to set aside for 1922 a certain amount of money which you will spend in your local newspaper, or in other advertising media, for announcements which will tell about the good warm air furnace you sell and about the careful manner with which you do the installation.

But aside from the ready-to-use advertisements which the manufacturers stand ready to furnish to the dealer-installer, there are many other forms of cooperative advertising or selling helps, as we sometimes term them, such booklets, envelope stuffers, great broadsides, banners, painted signs, fence signs of cardboard or metal, etc.; all of which when used properly by the dealer-installer is bound to produce results in the shape of personal inquiries, requests for further information, and when the dealer-installer follows these inquiries up—and makes use of the cooperation of his manufacturer in the matter of follow-up—he is almost certain to turn the prospect into a real customer.

Then there is the house organ, the number of which is almost legion. In these small periodicals, the manufacturer sends messages of interest and of encouragement to his customers, suggests new ways of approaching prospects and of landing them as customers.

Pages of one of these are shown on another page of this section.

On other pages we show sample pages from booklets, portions of broadsides, all of which will no doubt be examined and studied with interest by our readers.

It is interesting to note, by the way, that the manufacturers, as well as the dealer-installers, who kept up their advertising during 1921—even if in some cases it was reduced somewhat in volume—are a unit in testifying to the fact that there was business to be secured—and that they believed that they secured more than they would have if they had stopped advertising.

And it is also a significant fact that when you heard of a manufacturer or a dealer-installer who complained about "no business," he was almost certain to be found in the class of non-advertisers.

Incidentally, it seems only fair to state here that AMERICAN ARTISAN AND HARDWARE RECORD has once more demonstrated that when it comes to the matter of producing results when sales are hard

Seven Lennox Advertisments for 1921
How do you keep everything so clean?
Come right in and get warm!
"That's the last load, Mother"
Think!
When the Youngest Come In
Fifteen years of solid comfort
Lennox Torrid Zone Furnace Pipe or Pipeless
THE LENNOX FURNACE CO.
THERE is going to be furnace business this year regardless of the price of farm products for never in the history of the world have all of our farms produced so much as they did last year. It's got to move.
The salesmen who hustle the hardest are going to come back with the orders.
We are out to help our dealer salesmen with a million farm paper salesmen who will get inside of a million farm homes and sit down by the fireside with a million families to explain the comforts, the merits, the high quality and long life of Torrid Zone Steel furnaces. And these million bright salesmen with their pictures and their telling talk will call at every home seven times to repeat their arguments before their job is done
Then even a thousand Torrid Zone dealers will follow with their estimates of cost of installation and lastly—
Our trained traveling engineers will cover the map on their regular trips to assist our dealers in planning and meeting all heating problems. They will help sell upon your request
If you are in business to make money, your business wisdom will cause you to conscientiously study every line of this message—and then act quickly.
We have greatly enlarged our factory and foundry. We have installed larger and faster machinery. We can get the steel and the iron and the labor and we are going after the furnace business of 1921.
Are you?
MARVEL COAL CHUTE
THE LENNOX FURNACE COMPANY
200 LINCOLN HIGHWAY MARSHALLTOWN, IOWA

Figure 2.—Broadside Showing Magazine Advertisements Published by Lennox Furnace Company, Marshalltown, Iowa.

to make, this publication stands foremost in the class of warm air furnace trade papers. It is also worthy of mention that a very pleasing increase in our advertising patronage among warm air furnace manufacturers has been made during the year which has just come to a close.

The space which has been freely given to communications from manufacturers, wholesalers, dealer-in-

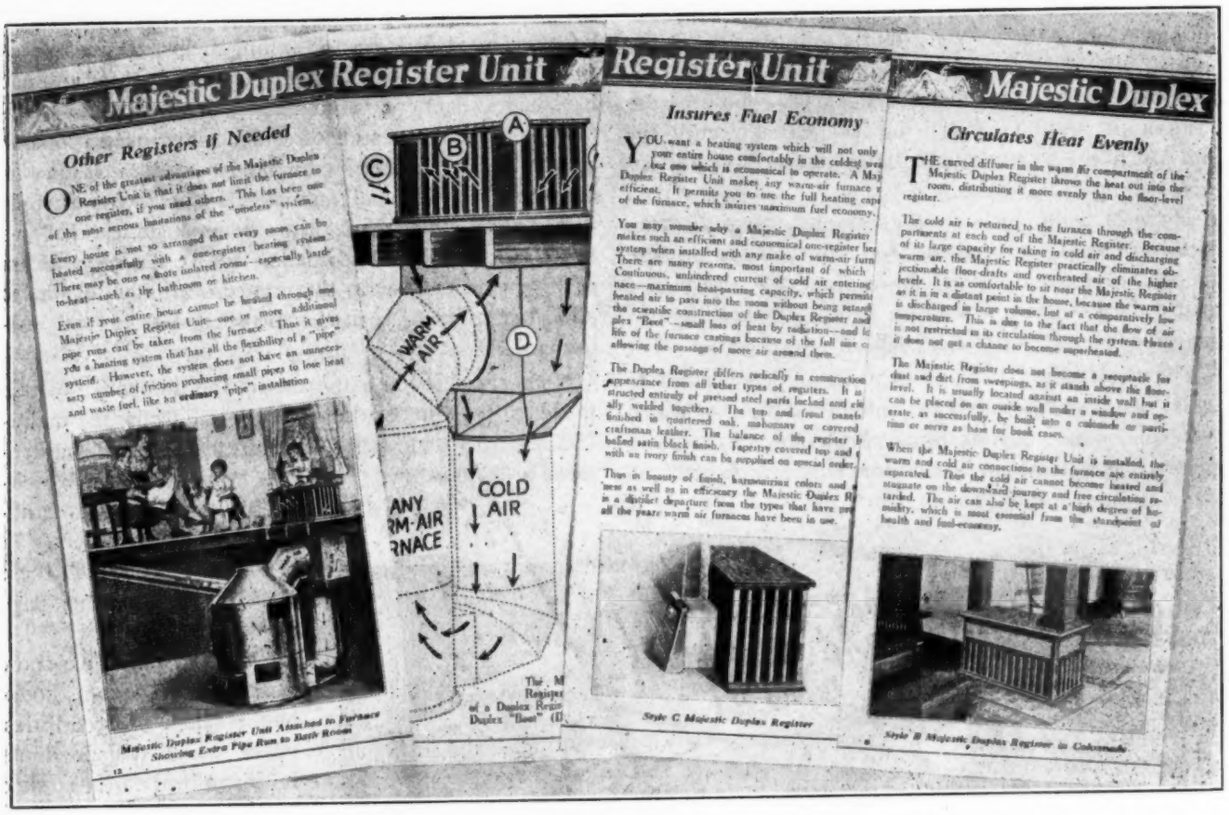


Figure 3.—Sample Pages from Attractive Selling Help Booklet Prepared by Majestic Company, Huntington, Indiana.

Fitting Remarks
OF THE W. E. LAMNECK CO.
A little magazine cut for and fitted to the needs of the sheet metal worker
furnace man
EDITED BY A. P. LAMNECK
PUBLISHED MON
No. 1
The President's Preamble
FITTING REMARKS
PIPES
What a great amount of evidence in suits and court cases comes in suit cases these days!
The size of a fight bears no relation to the size of the cause.
The public official who thinks he is a big gun should be fired.
A short line of logic beats a long line of talk.
The best apples are the ones the wind has the hardest time to shake off.
No man knows what public opinion is worth until he loses it.
If the man who knows it all would only forget it once in a while.
Possibly business might be revived and made to pay by prohibiting it.
K. D Round Pipe—Locks in a flash —No in or out mash.
Years and years of learning how make LAMNECK FITTINGS finest now.
Honesty is the best policy, but some people let it expire.
Time is money, but the hustler is the only one who can effect an exchange.
The ideal firm is the one who does not put the "I" before the "deal."
The time is ripe—Buy LAMNECK PIPE.
Elocution may teach us how to speak, but what will teach us when?
Bit on bit makes Ha-bit.
LAMNECK DOUBLE WALL STACKS—Come apart with ease, but only when you please.
Whatever you do, never kiss a girl with skill.
The Old Hand at the Game. Knows
Old timers who thought there was no such thing as a successful adjustable elbow are our biggest boosters after an experience with THE LAMNECK ADJUSTABLE ELBOW.
Neat as a silk clad ankle. Flexible as an eel's tail—they positively will not come apart. GET ACQUAINTED WITH THEM.
PRETTY SLICK!
The man who is convinced against his will—isn't.
Bought friends are never worth the p

Figure 4.—Sample Pages from Helpful House Organ Published by W. E. Lamneck Company, Columbus, Ohio.

stallers of warm air heating apparatus, and these communications have helped to place the industry on a higher plane.

We have been glad to cooperate in this great work, and we are glad to give credit to all who by their contributions—in form of constructive criticism—by suggestions for improvement have had so large a share in this work during the year just past.

FRONT RANK
STEEL FURNACES
perfected heating systems for homes—old or new.
My—what an improvement over a stove!
Installed Quickly
Installed Correctly
Installed Cheaply
TO LAST FOR A LIFE TIME
A GOOD PICTURE
is worth an hour's conversation.
Tell your story in the Moving Picture Show to hundreds of people.
The simplicity of the picture tells the story. It appeals to all home owners.
Our new slides, of which these cuts are proofs, are furnished in from two to four colors. They are free to you as FRONT RANK dealer. Order by number
HAYNES-LANGENBERG MFG. CO.
4045-57 Forest Park Boulevard
Saint Louis, U. S. A.
Why not enjoy all the comforts of the modern
FRONT RANK
Pipeless Furnace
One register warms whole house
Let us explain fully
FRONT RANK
STEEL FURNACES
FRONT RANK
STEEL FURNACES
Easy to operate
Stay in order
Take less fuel
Give more heat
and all the dirt is in the Basement!
FRONT RANK
furnaces send warm, moist air circulating all through the house

Figure 5.—Moving Picture Slides and Advertising Talk for Same Produced by Haynes-Langenberg Manufacturing Company, Saint Louis, Missouri.

Figure 6.—Series of Moving Picture Slides Furnished by Excelsior Steel Furnace Company, Chicago. Note the Sequence in Which They Run.

For we believe that the year of 1921 has been a very good year for the warm air furnace industry—not so much in sales, of course, but in the real progress which has been made.

There is a real appreciation among the whole body of men engaged in this industry of the important position to which the warm air furnace—properly made and efficiently installed—is entitled.

We are no longer apologizing for being in the warm air furnace business. We know that we are making a valuable product. We know that when we sell a warm air furnace we are not just selling a lot of cast iron, galvanized and tin pipe and some pressed metal in form of registers, but that we are selling a real heating apparatus.

And it is this attitude which will make things go much easier from now on. We have done a lot of hard pulling—some perhaps have worked a bit harder than others—and now all we have to do is to keep on remembering that warm air furnace installations can be sold at a fair profit without doing an injustice to the consumer.

Here again the service of cooperative advertising which so many manufacturers of warm air heating apparatus are furnishing to their dealer-installers will continue to be of great assistance.

For if you will notice, the examples which are shown on these pages—and which are truly representative—all emphasize the comfort, the convenience, the economy of operation, the safety which can be secured by having a warm air furnace installed.

They are not telling anything about the low price—except as to intimate, possibly, that a warm air furnace costs less to install, to maintain and to operate than any other form of centralized heating plant.

That is really of much more importance than many may possibly think. But consider for a moment the fact, that the attempt to sell warm air furnaces on a mere price basis—so many dollars for so much cast iron and so much sheet metal—was the very thing that for years made it difficult to induce people who might otherwise easily have been convinced as to the merits of a well made and properly installed warm air furnace to buy it at any price at all.

We have gotten away from that now to a very large extent, and much of the credit for this happy condition is due to the men who have stood out for real quality in their product—both in their foundries and in their work with the men who installed their product.

It is true, of course, that there are still some installers and some manufacturers whose principal selling point or argument is the low price at which they will install or make a warm air furnace, but while these will probably always be with us, the fact remains that they are finding it more and more difficult to secure business, and as a matter of fact, their principal field is now confined almost exclusively to the speculative house builder who cares little or nothing about what sort of contraption is put into the group of flimsy structures that he fabricates, so long as he can say that they have a heating plant.

All who are truly interested, however, in the upbuilding of the warm air heating industry are a unit in deprecating this cut-throat competition into which

No More Discomfort and Inconvenience
NEW IDEA Pipeless Furnace
NO MORE OF THIS
LESS WORK
LESS FUEL
For MORE HEAT See Us
Your Name and Address Here
Burn Less Fuel-Get More Heat
CUT down your fuel bill; save labor tending stoves; keep every room uniformly warm in zero weather. You can do it easily with a New Idea Pipeless Furnace, and in a day. No net work of pipes to put up—just one big register that sends a flood of warm, moist, clean air through the house.
Read our money-back written guarantee of satisfaction backed by the manufacturer. Let us explain everything.
Less fuel
Saves labor
No dirt
Guaranteed
DEALER'S NAME HERE
NEW-IDEA
Pipeless Furnace
"The one you've heard so much about"
EVERY ROOM EVENLY HEATED
THE WONDERFUL NEW Idea Pipeless Furnace
COSTS LESS TO INSTALL
BURNS LESS FUEL
LET US GIVE YOU PARTICULARS
Your Name and Address Here
Change to Warm Comfort in a Day
IN one day you can put up a New Idea Pipeless Furnace and heat every room and hall to 70 degrees in zero weather.
The New Idea costs but little more than a good stove and will burn less of any fuel than you burn now. Our money-back written guarantee of satisfaction is backed by the manufacturer.
Let us explain all the many advantages of the New Idea.
DEALER'S NAME HERE
NEW-IDEA
Pipeless Furnace
"The one you've heard so much about"
More heat
Less Fuel
No Dirt
Guaranteed
This Guarantee Protects You
Lasts a life time
Burns less of any fuel
Many patented features
Saves labor tending stoves
Heats whole house to 70 degrees
YOU take no chances when you order a New Idea Pipeless Furnace from us. The manufacturer is back of this money-back written guarantee of satisfaction.
Come in and read this guarantee. We'll explain the many advantages of New Idea heating and how much money it will save you every year. Costs little more than a good stove.
DEALER'S NAME HERE
NEW-IDEA
Pipeless Furnace
"The one you've heard so much about"
Less Fuel-Less Work
Warm Comfort Everywhere
EVERY room and hall will be kept at 70 degrees in zero weather when you get that New Idea Pipeless Furnace in your cellar. Your fuel bill will take a big drop, too.
A New Idea will cost you little more than a good stove and can be erected in a day.
You take no chances—our money-back written guarantee of satisfaction, backed by the manufacturer, protects you.
Come in and read it—today.
DEALER'S NAME HERE
"The one you've heard so much about"
NEW-IDEA
Pipeless Furnace
12 Advantages—12 Reasons
Why you will want New Idea Heating in your home to bring you the comfort and fuel economy others enjoy.
Advantages and Reasons
1. Every room comfortably warm all winter—
2. Get all the heat from the fuel—no waste—
3. Low fuel bills—
4. Mussless, dustless house—
5. Can burn any fuel successfully—
6. Moist heat that prevents that "stuffy feeling"—
7. Cool cellar for vegetables—
8. Cellar and house free from gas and dust—
9. Easily installed in a day—
10. Low installation cost—
11. Long life of furnace—
12. You take no risks—
Scientifically constructed furnace and big dust and gasthight registry that distributes all heat evenly
Hot Blast Feed Door supplies necessary oxygen to make complete combustion.
Burns no more coal than a stove
Does away with carrying coal and ashes through house
Patented non-clinker grate.
Extra large water pan.
No pipes to heat cellar.
The exclusive Franciscus Feed Door.
No net work of pipes to put up—only one opening to cut in floor
How Idea cost little more than a good stove but does work of half a dozen.
The best of materials and Cup-joint construction.
Binding money-back written guarantee of satisfaction.
Come in and ask to see the guarantee and learn all about this wonderful furnace.
DEALER'S NAME HERE
NEW-IDEA
Pipeless Furnace
"The one you've heard so much about"
Better Home Heating at Less Cost
FOR less fuel than your stoves are burning you can keep your whole house uniformly warm in zero weather.
Then, why have cold halls and bedrooms and overheated sitting and dining rooms when, in a day, you can have a New Idea Pipeless Furnace and end discomfort?
Ask us for full details and a copy of our money-back written guarantee of satisfaction which is backed by the manufacturer.
DEALER'S NAME HERE
NEW-IDEA
Pipeless Furnace
"The one you've heard so much about"
Many exclusive patented features

Figure 7.—Ready-to-Use Advertisements Furnished by Utica Heater Company, Utica, New York. Note Also the Two Moving Picture Slides in the Upper Corners.

installers are allowing themselves to be drawn, because they realize that every poorly installed warm air furnace and every warm air furnace which is too small for the job which it is supposed to perform stands as an obstacle that has to be overcome by every conscientious installer when he is trying to sell a proper installation.

But to get back to the main subject of this article let us consider for a little while some of the means by which manufacturers may and do cooperate with their dealer-installers in the matter of increasing the interest and favorable opinion of the house owner in warm air heating in general and in some specific warm air furnace.

It is a thoroughly recognized fact that the average sheet metal contractor and dealer-installer of warm air furnaces come up from the bench and for that reason is more likely to be a good mechanic than a high-grade grammarian, and that for this reason he is loath to put his own words down on paper to be set in type.

The manufacturer, therefore, adds a substantial selling argument for his line when he prepares copy with suitable illustrations which may be used by his dealer-installers, and it is a very significant fact, that every year witnesses a material addition to the number of manufacturers who thus render their customers a special service outside of the well made warm air furnace they sell.

In some cases this service is restricted to the furnishing of proofs of ready-to-use advertisements, together with the necessary illustrations of the apparatus.

Other manufacturers go a step farther and make mats, electrotypes or stereotypes of the entire advertisement, with a mortise for the insertion of the dealer-installer's name and address, such as, for example, those shown in Figures 1, 7 and 10.

Still other manufacturers publish attractive booklets or folders, many of them printed in several colors with special cover designs, such as are shown in Figures 3, 9 and 11.

In another group we have the manufacturers who go in for the so-called "consumer advertising," using farm publications and other magazines of more or less general circulation. An example of such publicity is shown in Figure 2.

Then there is the house organ in which the manufacturer suggests new methods of approach, follow-up and "closing" arguments, with an occasional idea for an advertisement. Figure 4 shows two pages from one of the house organs.

Figures 5, 6 and 7 show samples of moving picture slides which are proving quite popular as a means of advertising which is both attractive and easy to make use of.

Then there are the "broadside" mailing pieces, which are either furnished to the dealer-installers with their imprint or are mailed by the manufacturers to prospects the names of which are sent in by their customers. Such a one is shown in Figure 8.

Without in any way attempting to emphasize unduly any of the examples of cooperative advertising which are reproduced in this article, it is felt that

There are Ten Good Reasons
why you should Choose a
MONCRIEF FURNACE
For Heating That Home of yours
1 Double casing affords a dead air space that provides the best possible form of insulation. Heat is not wasted down cellar but all goes upstairs.
2 Feed section is cast all in one piece, extra heavy. It has corrugated sides which provide for contraction and expansion, and present greater radiating surface.
3 All joints are carefully ground and fitted to make them perfectly tight. No danger of smoke and gas escaping into the air chamber and then on into your living rooms.
4 Grates are triangular with three service sides. Easy working and practically self-cleaning. Any bar is quickly and easily replaced.
5 Large roomy ashpit with tight fitting door makes cleaning out easy and lessens the liability of burning out the grate bars.
6 Large radiator with long fire travel delivers all the available heat before releasing the smoke and gases to the chimney.
7 Clean-out is part of radiator casting. It extends beyond the casing, making it impossible for smoke and gas to leak into the air chamber.
8 All doors have beaded edges and are ground straight and smooth so as to fit tight all around, which insures perfect draft.
9 Fire pot, cast in two sections, allows liberal expansion and contraction. Note the straight inches—this insures free burning and economical consumption of coal.
10 Draft door is cast solid, with edges accurately ground; permits draft to be easily regulated from either basement or upstairs.
MONCRIEF
Built for Lifetime Service
The heating system is the most important part of your house. A good heating system means comfort with economy and will last a lifetime. A poor heating system wastes more fuel every year than the difference in cost between it and a good heating system and before many years it will probably have to be replaced.
Install a Moncrief Furnace and you are assured of heating comfort year after year. The cost of fuel is remarkably low. The Moncrief is easy to care for. Nothing to get out of order, no parts to deteriorate and need periodic replacement. Cast of finest grey iron. A better furnace is not made at any price.
-and it's not expensive either

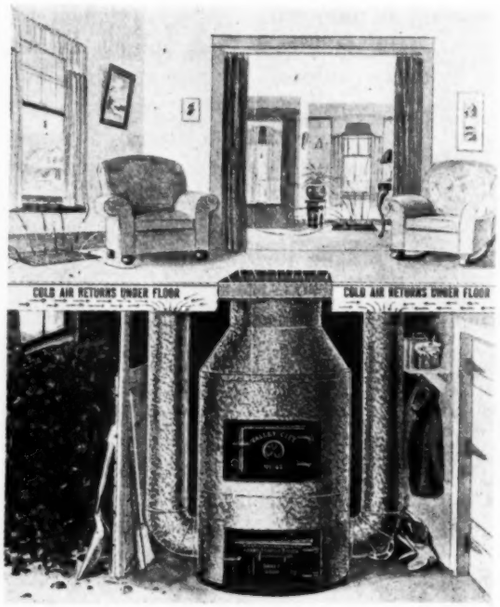
Figure 8.—Center Page of Broadside Mailing Piece Prepared by Henry Furnace & Foundry Company, Cleveland, Ohio, for Follow-up.

Buy the "TRIPLEX" system for houses having one or more isolated rooms, where two cold air returns are necessary for perfect circulation.

Specifications of the Valley City Furnace

Height of Castings	52½ inches
Depth of Ash Pit	13 inches
Depth of Firepot	12½ inches
Height of Radiator	27 inches
Diameter of Firepot	24 inches
Size of Feed Door	10 x 14 inches
Size of Ash Door	9 x 17½ inches
Smoke Outlet	8 inches
Diameter of Casing	42 inches
Roughing in Measurements	6 to 8 feet
Size of Warm Air Register	22 x 22 inches
Size of Cold Air Returns	14 inches
Size of Cold Air Grilles	12 x 30
Heating Capacity	5 to 8 ordinary rooms

The VALLEY CITY FURNACE may also be had in the "DUPLEX" system, with one extra large cold air return in place of two smaller returns.



Cut Showing How Valley City Furnace Will Look in Your Basement

Buy the "DUPLEX" system for houses which have archways between principal rooms, and especially for those houses having open stairways.

The Ash Section is heavy cast iron with base countersunk 2 inches. The grate which rests in the ash section is a marvel of simplicity and ease of handling. It may be shaken or dumped to suit the operator's convenience, and it will clean the fire from center to edges of the firepot. This grate is heavy and exceptionally well constructed.

The ash door and the fire door are of sufficient size so that the grate may be taken out through either.

The radiator is exceptionally large and well proportioned, having a great amount of direct radiating surface which is all self-cleaning. This radiator is made from 18-gauge charcoal iron securely riveted and made absolutely gas-tight with asbestos retort cement. It will not leak and is so guaranteed.

The Dome of the Radiator is heavy cast iron reinforced to withstand expansion and contraction. The joints are deep and well fitted. Where the radiator rests on the firepot, it is fitted with a heavy cast iron inner lining 4 inches high which protects the radiator at a point directly above the firepot. The smoke collar is cast iron and properly secured to the radiator.

The main objection to the so-called "PIPELESS" furnace, is that the cold air is returned to the furnace above the floors.
Either the "DUPLEX" or the "TRIPLEX" system used with the VALLEY CITY FURNACE takes the cold air to the furnace below the floors, thus giving you all the advantages of a pipe furnace.

Figure 9.—Center page of Broadside Mailing Piece Prepared by Taplin Furnace Company, Grand Rapids, Michigan, for Follow-up.

some of the statements made in these advertisements are well worthy of special reference, and we first call attention to the paragraph in the right-hand corner of Figure 1, which reads as follows:

"Each home or other structure presents individual problems that must be properly solved or that furnace will never give real satisfaction. Proper installation has as much or more to do with the way a furnace performs as does the way the furnace itself is made."

If every dealer-installer would make it a point to properly emphasize this fact to his prospective customer, he will not only be liberated from the destructive price competition of the man who cares nothing about how the warm air furnace he puts in is going to operate, but he will make sure that the particular installation which he is trying to secure will stand to his credit when itis completed.

The idea of increased comfort secured by the pipeless warm air furnace as against the common heating stove is well brought out in the series of newspaper advertisements reproduced in Figure 7, such as, for example:

"Cut down your fuel bill; save labor tending stoves; keep every room uniformly warm in zero weather."

The quality point is emphasized in this paragraph taken from the advertisement reproduced in Figure 8:

"The heating system is the most important part of

Figure 10.—Three of the Many Effective Newspaper Advertisements Furnished by Premier Furnace Company, Dowagiac, Michigan.

your house. A good heating system means comfort with economy and will last a life time. A poor heating system wastes more fuel every year than the difference in cost between it and a good heating system and before many years it will probably have to be replaced."

Here is a bit of good advice taken from a very fine booklet which did not lend itself to reproduction:

"Selecting your furnace while of the utmost importance is only half the task. The other half, of equal significance, is the installation. The best furnace in the world can be ruined by a poor installation, and the worst furnace can be improved by a good installation, Therefore, unless you are a specialist in warm air heating installations, do not for your own sake, or that of your family, try to install your own furnace. It may prove as injurious to your health as trying to perform a surgical operation if you are not a surgeon."

Noted Ventilation Authority Comments on Jaines Paper in December 17th Issue.

In a letter to AMERICAN ARTISAN AND HARDWARE RECORD, F. R. Still, vice-president of the American Blower Company, Detroit, Michigan, comments on "Fan System Heating for Homes," the paper prepared by E. L. Jaines, of the Northwestern Furnace and Supply Company, Minneapolis, Minnesota, which was read at the recent annual meeting of the Western Warm Air Furnace and Supply Association.

Mr. Still, who is recognized as one of the best posted men on heating and ventilating, has this to say about the matter of maintaining high temperatures:

"Mr. Jaines' arguments are sound on this point. It naturally follows that the higher the temperature of the air as it enters the building, the greater difference there will be in the difference of the temperature at the ceiling and the floor where it enters, and the higher

RENOWN
A Superior Heating Service
Come Right In
The House is FIN
The RENOWN will make Every Room cozy next Winter
Getting Rid of the COLD Air—

Figure 11.—Sample Pages from Very Attractive Folder in Colors Published by Independent Stove Company, Owosso, Michigan, for Their Customers.

The following paragraph from Figure 10 emphasizes the matter of repairs on poor furnaces in a very pertinent manner:

"The installation cost is just the first cost of a cheap furnace. To repair its cracked or rusted-out parts costs many times the difference."

By putting this statement before the prospective purchaser of a warm air furnace in a judicious manner, it is very often possible to induce him to change from the erroneous notion he may have if the ease with which a warm air furnace may be installed.

To sum it all up, the progressive dealer-installer and the progressive manufacturer of warm air furnaces are fast coming to the point where every angle of the selling is being covered in a cooperative way by various means of advertising, and just as progress is being made right along in the manufacture and installation of warm air furnaces, so is progress also being made in the methods employed in the sale of these healthful appliances for heating and ventilating the homes of our people.

Price Ceases to exist where Value Overrides it.

the room the greater the difference.

"The logic of this is perfectly plain when one stops to consider what would be the effect if the air was brought into the room at 80 degrees. If the room was to be maintained at 70 degrees it would require a tremendous volume of air at 80 degrees temperature to heat the room, but naturally we could not expect a temperature in excess of 80 degrees at the ceiling with 70 degrees at the breathing line.

"If the temperature of the incoming air was raised to 160 degrees a comparatively small volume of air would be required, as in the other case, to convey the same amount of heat. There would, however, be a vastly greater difference in the temperature between the floor and ceiling which in some cases might amount to as much as the entire difference between the high-temperature of the incoming air and the temperature at the breathing line.

"While Mr. Jaines does not say so directly, there is an implication in his remarks that he would attribute this difference to a considerable loss of efficiency. This is not the case in every building. In a light, thin, cheaply built structure, constructed of material that readily

conveys heat, the loss by radiation to the surrounding atmosphere would be very great and almost in direct proportion to the difference in the temperature of the higher stratas; but when applied to a building that is well built and constructed of materials which have little conductivity, the loss due to the temperature near the ceiling is not so great and, in fact, it might be neglected entirely.

"The exception to this last would be in buildings having numerous skylights or in manufacturing plants having metal sash where the windows are carried clear up to the ceiling line and the walls are almost a continuous line of windows. In such buildings the glass in the upper part of the rooms will conduct heat if there is a decided difference in temperature between the ceiling and floor.

"A plant always proves to be far more satisfactory when designed on such lines as will permit of large volumes of air and low temperatures and low velocities being used. Small volumes necessarily mean high velocities, and high velocities mean waste of power in the movement of the air. Small volumes also mean higher initial temperatures, and even though in most cases the losses, due to conduction through the walls, will be no greater than when large volumes are used, the chances are that it will be greater and in some types of buildings it is bound to be greater."

Officers Appreciate Thorough Report by AMERICAN ARTISAN.

It was Shakespeare who said, "Our praises are our wages."

There is no greater stimulant to better craftsmanship than words of appreciation of work already done.

Wherefore, there is incentive to more earnest effort for the coming year in the subjoined letters of appreciation from officers of the Western Warm Air Furnace and Supply Association.

The letters refer to the report of the recent annual meeting of the Association published on pages 19, 20 and 21 of the December 17, 1921, issue of AMERICAN ARTISAN AND HARDWARE RECORD, written by Etta Cohn, manager, who was present at all the sessions.

The first of the letters is from E. I. Dodd, retiring president of the Western Warm Air Furnace and Supply Association, as follows:

Miss Etta Cohn, Manager, AMERICAN ARTISAN AND HARDWARE RECORD:

As retiring president of the Western Warm Air Furnace and Supply Association, I wish to thank you very kindly for your personal efforts in reporting our meeting at Des Moines on December 14th.

It is to be hoped that reports of this kind will give us a prestige among other Associations who have sought, in the past, to ignore us, and, while we know that we are the livest bunch in America today, connected with the furnace industry, there are many of our eastern friends that would be glad to kill off our Association, if they thought it possible to do so.

Again I wish to thank you for the splendid report you gave us.

E. I. DODD.

Sioux City, Iowa, December 23, 1921.

The next letter is from John H. Hussie, who was re-elected secretary of the Western Warm Air Furnace and Supply Association. It is herewith reproduced:

Miss Etta Cohn, Manager, AMERICAN ARTISAN AND HARDWARE RECORD:

I wish to compliment you and also thank you for the very comprehensive writeup given the Des Moines meeting of the Western Association. It is always a pleasure to have you with us in these meetings and doubly so when you so ably represent your paper. Wishing you a happy holiday season, I am,

Yours very truly,

JOHN H. HUSSIE.

Omaha, Nebraska, December 23, 1921.

The third letter comes from F. L. Nesbit, former president of the Association. It is as follows:

Miss Etta Cohn, Manager, AMERICAN ARTISAN AND HARDWARE RECORD:

Referring to your report of the convention of the Western Warm Air Furnace and Supply Association at Des Moines, Iowa,

I wish to compliment you on this report, as I believe that this report should do the Association a great deal of good.

It is the most complete report that has ever been made by any reporter so far on any of our convention meetings, and I certainly want to thank you for the splendid report given us.

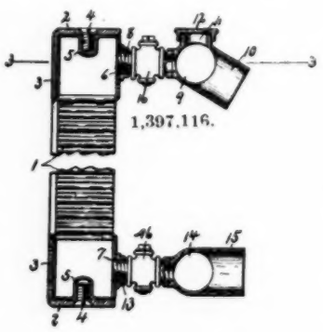
Yours very truly,

F. L. NESBIT.

Omaha, Nebraska, December 23, 1921.

United States Patent Rights Are Granted for Radiator.

United States patent rights have been granted to William Sparker, Jackson, Michigan, assignor to The Sparks-Withington Company, Cleveland, Ohio, a Corporation of Ohio, under number 1,397,116 for the radiator described as follows:



A radiator comprising a plurality of separate radiator units arranged side by side and each unit comprising an upped water chamber and a lower water chamber connected by a water tube, one of said water chambers provided with an inlet for the fluid and the other of said water chambers provided with an outlet for fluid, a source of fluid connected to the inlet of each of said units and valves for disconnecting any one of said units from said source of fluid, a discharge for fluid connected to the outlet from each of said units, valves for disconnecting any one of said units from the said discharge for fluid, a band extending around the assembled radiator units, and means for securing each unit to the band.

Plan for Warm Air Furnace Plant in Church Which Overcame Several Difficulties.

Special Arrangements Made to Prevent Syphon Action of Extra Large Pipes Against Small Pipes.

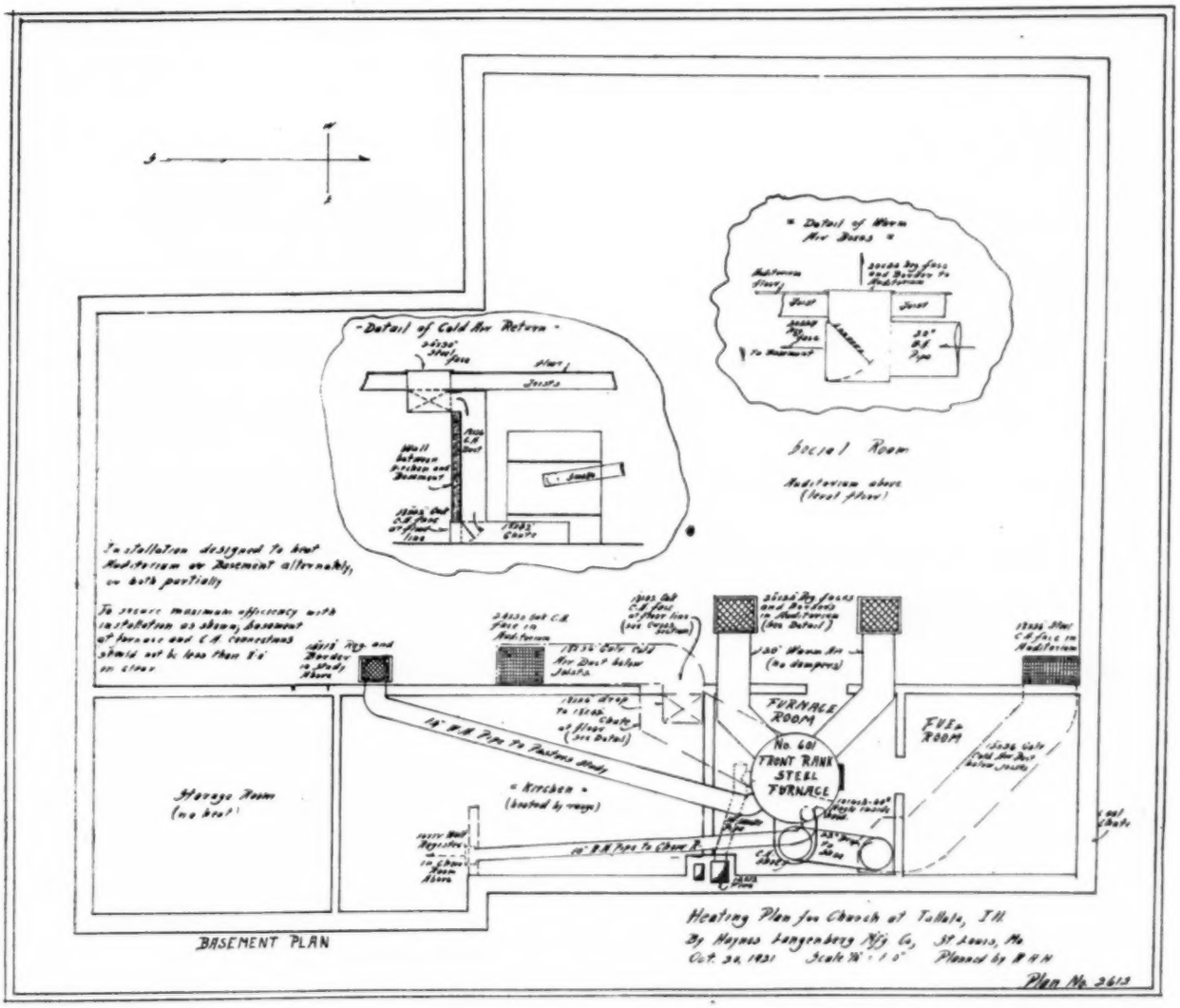
The illustration shown herewith is an example of the many problems confronting the warm air furnace contractor who is asked to submit bids on heating churches, schools, theaters or other buildings which have the furnace or boiler room located at a position in the basement where it is necessary to use exceptionally long pipes to convey the heat to the various rooms.

In churches especially, where the utilizing of space is of importance, and the basement is to be used for social purposes, meetings, etc., it is practical when the building is designed to place the furnace or boiler room at either the front or rear of the building or at either of the side walls to secure as much unobstructed floor space as possible.

The importance of designing the system to secure maximum efficiency and reduce the initial and cost of operation to a minimum should be given careful consideration.

The building illustrated here has a large auditorium, pastor's study and choir room upstairs and a large social room in the basement to be heated.

The furnace room is placed on the east side of the building, favoring the north. In most churches, as is the case in this one, the auditorium and upstairs rooms are not to be heated at the same period as the social hall or meeting room in the basement.


Detail of Cold Air Return
Detail of Warm Air Ducts
Social Room
Auditorium above (Second floor)
Installation designed to heat Auditorium or Basement alternately, or both partially
To secure maximum efficiency with installation as shown, basement of furnace and C.A. connections should not be less than 9'6" in clear
Storage Room (no heat)
Kitchen (heated by range)
FURNACE ROOM
FUEL ROOM
No. 601 FRONT RANK STEEL FURNACE
24" W.R. Pipe To Pastors Study
BASEMENT PLAN
Heating Plan for Church at Tallula, Ill.
By Haynes Langenberg Mfg Co, St Louis, Mo
Oct. 30, 1931 Scale 1/8" = 1'-0" Planned by R.H.H.
Plan No. 2613

Basement Plan of Church, Showing Location of Warm Air Furnace, Heating Pipes, Registers, Return Air Ducts, Etc. Plan Designed by Engineering Department of the Haynes-Langenberg Manufacturing Company, Saint Louis, Missouri.

After determining the heat requirements of the building, it is found that a warm air furnace having an air carrying capacity of not less than 850 square inches must be used.

By referring to the illustration it will be noted that two twenty-inch pipes have been specified for the heating to the auditorium and social hall in the basement,

these being the principal heating units.

A special warm air box has been designed so that the entire capacity of each pipe can be discharged into either the auditorium or social hall as desired.

Or the valves in the boxes can be arranged to discharge a portion of the heated air into the auditorium and the balance into the basement.

Separate pipes have been specified for the heating of the pastor's study and choir room as these spaces are independent of the church proper, or auditorium.

On the ten-inch pipe to the choir room, a sixty degree angle should be used inside of the casing hood in order to insure full capacity.

It is evident that the two twenty-inch pipes will syphon a large portion of the air in the casing reservoir and the velocity of air in the smaller pipes will be weak unless some provision is made inside the casing hood. To insure as even distribution of air in each of the pipes as possible, a tin or galvanized iron plate, to act as a baffle, should be hung inside the hood as shown on the illustration.

Cold air returns have been arranged to take the air from either the auditorium or social hall as may be required. A large return has been specified to take the air from the exposed or north side of the auditorium, with a rectangular duct running below the basement ceiling through the fuel room with connection to a round duct dropped to the furnace.

The other duct from the auditorium leads from the foot of the pulpit to a rectangular duct along the basement ceiling line and thence drops through the wall separating the kitchen from the social hall an 18x42 chute at the basement floor line.

A cold air face is used in the wall at the basement floor line to take the air from the social hall when this space is being heated. A valve should be used in the duct and regulated to take the air from either space as required. A glance at the cross section detail will give the reader an idea of this arrangement.

Wherever convenient the ducts are run along the basement ceiling line to provide as much headroom as possible. A minimum basement depth of 8 feet at the furnace and cold air connections is required to secure maximum results with the system designed.

What may seem objectionable is the running of the cold air duct through one corner of the kitchen. This condition can only be relieved by the use of cold air trenches and pit below the basement or grade level. In the section of the country where the building is located the latter arrangement can not be used on account of the danger of seep water.

Makes Plans to Increase Its Warehouse Facilities.

The growth in the volume of its business is such that the W. E. Lamneck Company, Columbus, Ohio, is making plans for a new warehouse building which will contain 24,000 square feet of floor space.

The new structure will be so built that extension can be put on the end of it, with an equal amount of floor space, at a future date.

Simplified warm air heater fittings are manufactured by the W. E. Lamneck Company. The increase in the volume of sales of these products indicates an improvement in the warm air heater trade which is an encouraging prospect for the coming year.

Makes All Sizes of Warm Air Heater Patterns.

The next five years are going to be home building years.

Why? Because the workingman is learning, as never before, what home and its comforts really are, and also how to buy equipment for that home that will make it comfortable; and the good well built furnace is, next to his family and his eats, the one thing that will make his home comfortable.

A house, no matter how fine, must be warm and cozy to live in during the chilly and cold days.

This warm air heating unit in his home must be good, yet simple to handle. Like his car, or his dog,

Showing Big Warm Air Heater Pattern, Made by the George E. Shaw & Son Company, Cleveland, Ohio.

or any hobby, he will learn to place confidence in his furnace, if it takes care of him when he needs the warmth that it should give.

Improvements in every department of manufacture of warm air heaters render it easy and practicable for the householder today to get a warm air heater which will amply meet all the requirements of comfort in the severest weather.

Among the improvements needed might be mentioned the better facilities for making more accurate furnace patterns. An example in this direction is furnished by the George E. Shaw and Son Company, 1362 East Third Street, Cleveland, Ohio.

This firm has worked out definite plans for the building of complete equipment for furnace patterns through thirty years of successful experience.

Excellent Plan for Installation of Warm Air Heating Plant for Residence.

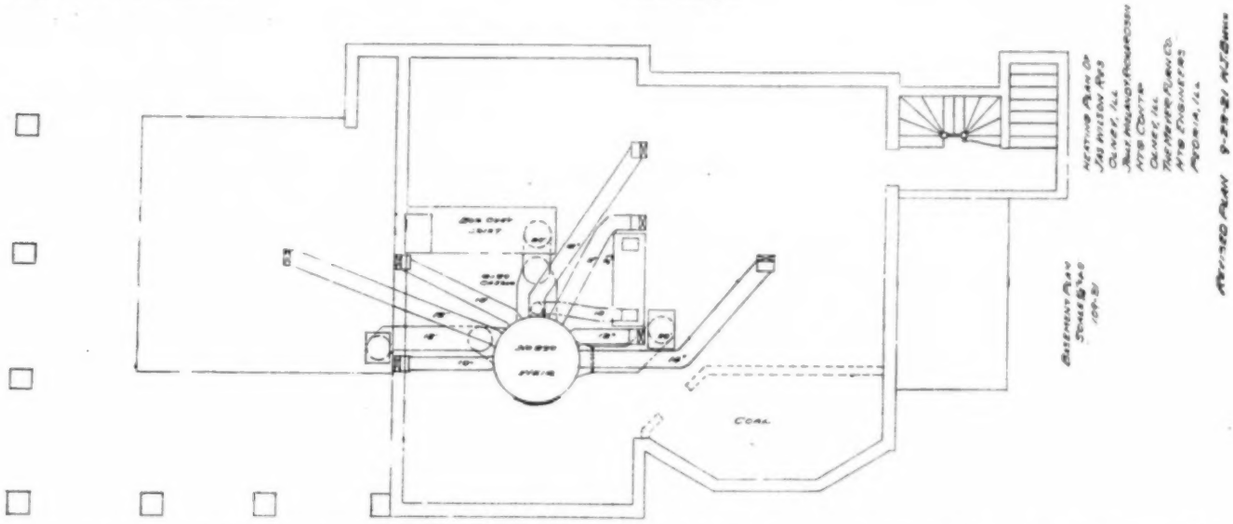
Oversize Warm Air Furnace Used and Smallest Pipe Is Ten Inches in Diameter. Excess Delivery of Heat Is Ten Per Cent.

In the accompanying illustrations are shown the basement, first and second floor plans for the installation of a warm air heating plant in the residence of James Wilson, Olney, Illinois.

The installation was made by Jolly, Wieland & Richardson at Olney, from plans worked out by the Engineering Department of the Meyer Furnace Company, Peoria, Illinois.

"The furnace is located almost in the center of the building, thereby making it possible to take off an equal amount of warm air from all sides of the furnace and also to deliver the return cold air at the bottom of the casing in the same manner.

"None of the warm air pipes in the basement are over 14 feet long, which gives the furnace a decided advantage.



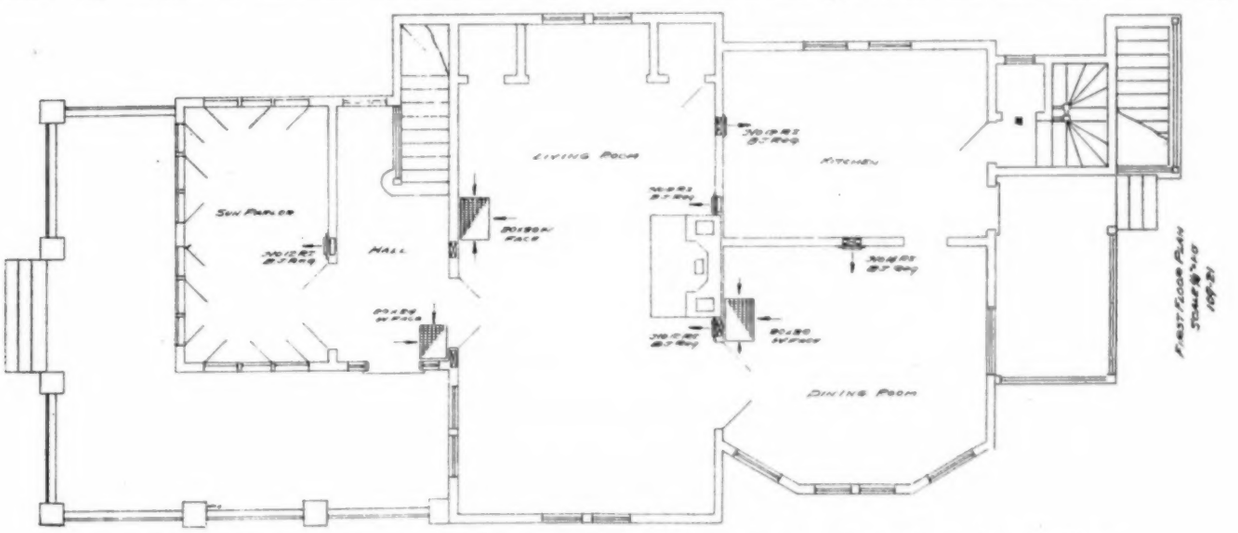
Basement Plan for Warm Air Heater Installation in Residence of James Wilson, Olney, Illinois. Work Executed by Jolly, Wieland & Richardson, Olney, From Plans Furnished by Engineering Department of Meyer Furnace Company, Peoria, Illinois.

The following explanatory details were furnished by R. C. Walker, General Manager of the Meyer Furnace Company:

"In planning this particular heating plant, we have been very careful to take into consideration all the details we were able to obtain from plans and sketches furnished to our Engineering Department by the owner.

"We have been careful, also, not to take any of the warm air pipes off over or near the front of the furnace, as the feed pouch prevents pipes so located from receiving their full amount of warm air.

"Our Number 330 Weir Gas and Soot Consuming Furnace is capable of delivering 1,018 square inches of warm air area while burning soft coal at the rate of five pounds per square foot of grade surface.



First Floor Plans for Warm Air Heater Installation in Residence of James Wilson, Olney, Illinois.

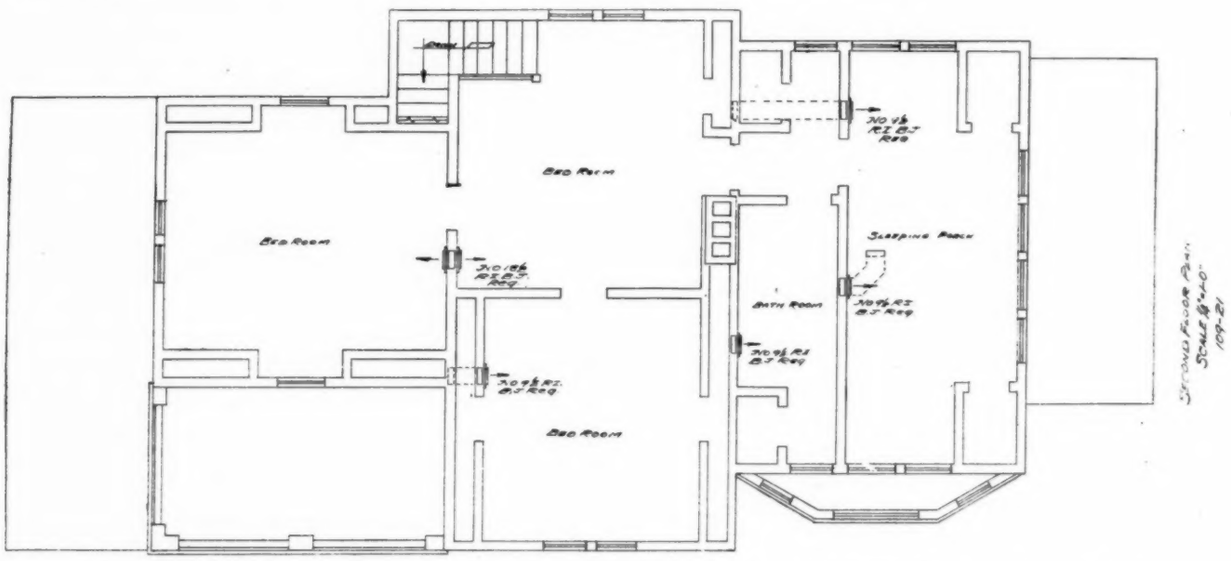
"In figuring the cross sectional area required to heat the building we find it requires 762 square inches, leaving 256 inches in reserve. Our next smaller size furnace, or Number 300 Weir, would in all probability heat this building but we have specified a Number 330, as we feel it is always best to take the next size larger furnace than is actually required for the building.

"The total cross sectional area of the cold air returns is 882 square inches, an amount about 12 per cent in excess of the total cross sectional warm air outlets. This, we feel, is also a good feature as it insures quick circulation.

"All registers used are guaranteed to deliver the full capacity of the warm air pipes leading to them.

"We have also taken into consideration the length of smoke pipe which you will notice is only a short distance from the furnace."

It is suggested that the two tables in Mr. Walker's description of this installation be carefully re-read and considered. There are several important points to be observed from these tables, such as the excess of heat area delivered to all of the rooms, except the sun parlor, which of course does not require much heating during the winter months.



Second Floor Plan for Warm Air Heater Installation in Residence of James Wilson, Olney, Illinois.

"The following tables give the capacities and exposures of the various rooms heated:

Name of Room.	Size.	Height of Ceiling.	Glass Exposure.	Wall Exposure.
Dining room	16.6x14.0	9.0	44	217
Sleeping porch	12.0x10.0	8.0	30	146
Kitchen	15.6x11.0	9.0	30	150
Sleeping porch	12.0x10.0	8.0	30	146
Living room	25.6x14.6	9.0	60	292
Bath	6.0x15.0	8.0	10	38
Sun parlor	9.0x15.0	9.0	166	111
Bed room	12.0x15.0	8.0	28	138
Bed room	13.0x15.0	8.0	17	87
Bed room	13.0x15.0	8.0	37	187

Name of Room.	Cubical Contents.	W. A. Area Required	W. A. Area Delivered	Pipe Inches.
Dining room	1953	85	...	..
Sleeping porch	960	40	154	14
Kitchen	1539	60	...	..
Sleeping porch	960	40	113	12
Living room	3915	128	...	..
Bath	720	21	226	2-12
Sun parlor	1215	189	113	12
Bed room	1440	42	...	..
Bed room	1560	36	78	10
Bed room	1550	46	78	10
Total	15822	687	762	

"In going through the table, it will be noted that in figuring the areas we have split the sleeping porch. This was done because the room is being heated by extension stacks from the registers in kitchen and dining room. We are also heating the bath room from an extension stack on one of the registers in the living room.

"We have figured the warm air area required to heat the second floor rooms 25 per cent less than that required to heat the first floor rooms, owing to the increased velocity to second floor rooms.

A. W. Glessner Will Spend Winter in Mediterranean Countries.

A. W. Glessner, president of the Excelsior Steel Furnace Company, Chicago, will leave for a tour of the European, Asiatic and African countries bordering in the Mediterranean Sea, early in February.

With Mrs. Glessner and their youngest son, Herbert, they will join a party in New York, and their first stop will be at Madeira, where the famous laces and the exhilarating liquid which it is no longer safe to possess in this country are made.

"A. W." did not indicate what was the particular reason for making Madeira their first landing place.

From there the party will go to Gibraltar, various Spanish cities, Algiers, Greece, Turkey, Palestine, Egypt, where they will journey inland to the Cataracts of the Nile, then to Italy, France and England.

Herbert Glessner will go from Paris to various places in Belgium and Holland while Mr. and Mrs. Glessner will visit in England.

They expect to return to Chicago late in April.

Here is hoping that they will have a fine trip and enjoy themselves to the fullest possible extent.

Incidentally, it is interesting to note that in about six weeks—on February 14th, to be exact—Mr. Glessner will have completed 41 years of business for himself. He has been buying steel for 42 years, which makes him one of the oldest steel buyers in the United States, so far as number of years in service goes, but "A. W." is as spry as if he had just begun to work.

Combination of Gravity and Fan Booster System Proves Successful for Church Heating.

This Type of Warm Air Heating Plants Can Be Installed to Advantage in Buildings Where Steam Is Not Used for Industrial Purposes.

In the accompanying illustrations are shown tracings of the plans for the installation of a warm air heating and ventilating system which were designed by the Engineering Department of the Excelsior Steel Furnace Company, Chicago, for the church of Saint Hilda Episcopal Parish, at River Rouge, Michigan.

The plant was installed by Charles Raymo, 2826 Twenty-third Street, Detroit, Michigan.

Tracings of the building were sent by the building committee of the church to various manufacturers of heating apparatus before deciding on the construction of the building, and the care with which the installation plans of the Excelsior Company were drawn and explained had a great deal to do with the decision to use their apparatus.

In talking with Luke McNamee about this job, we learned that it was only one of many that have come to them through church architects and contractors who have learned of the successful systems and layouts designed by the Excelsior Company.

The layout speaks for itself and details on the plans affords those who may be interested in same to check them up. The building contains 103,200 cubic feet of space.

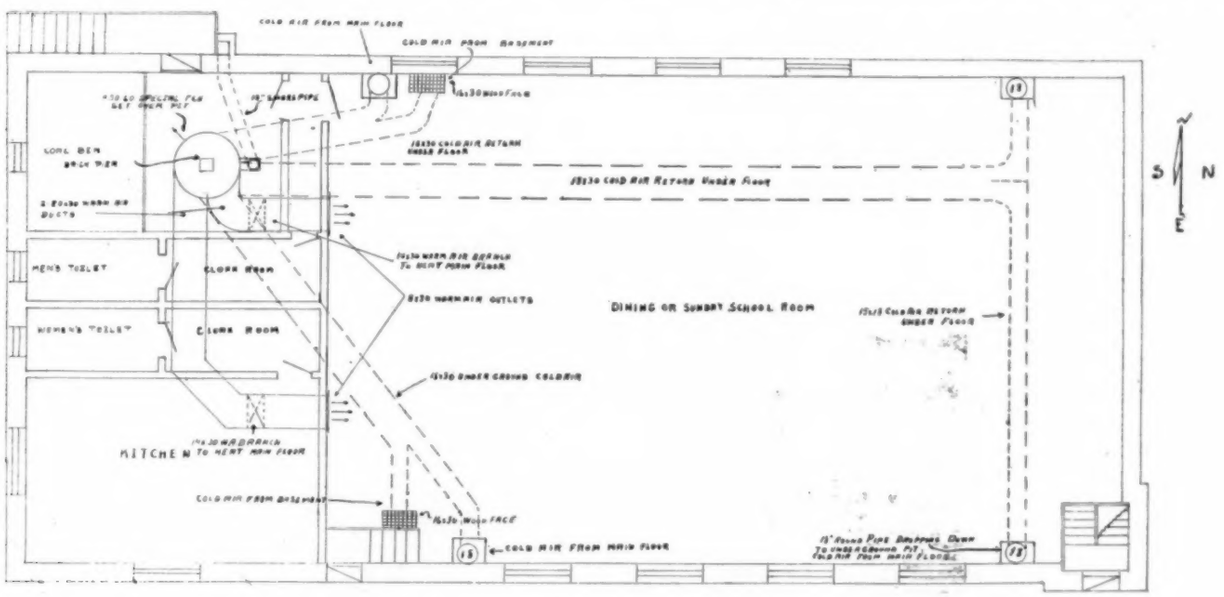


Figure 1.—Basement Plan for Warm Air Heating and Ventilating Apparatus with Booster Attachment. Installed by Charles Raymo, Detroit, Michigan, from Design Made by Engineering Department of Excelsior Steel Furnace Company, Chicago.

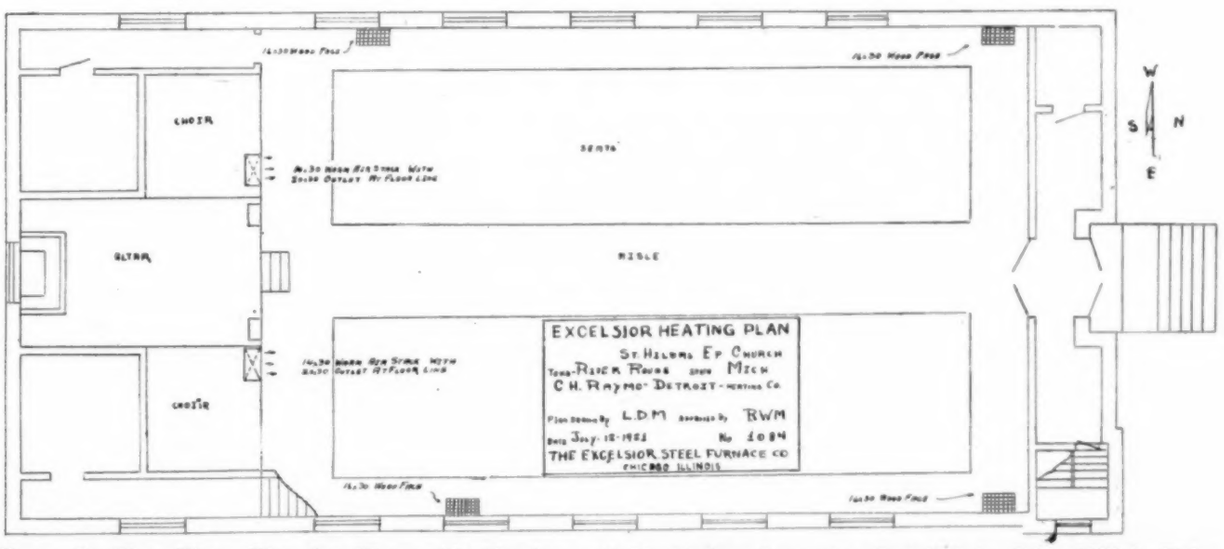


Figure 2.—First Floor Plan for Warm Air Heating and Ventilating Apparatus Installed in Saint Hilda's Episcopal Church, River Rouge, by Charles Raymo, Detroit, Michigan.

The heating is figured on a twenty minute air change and is divided as follows:

First Floor.

86 × 40 × 20 = 68,800 cubic feet.
68,800 × 3 Changes = 206,400 cubic feet.
206,400 ÷ 60 Minutes = 3,440 cubic feet.
3,440 ÷ 600 Velocity = 5⅔, or 800 square inches.

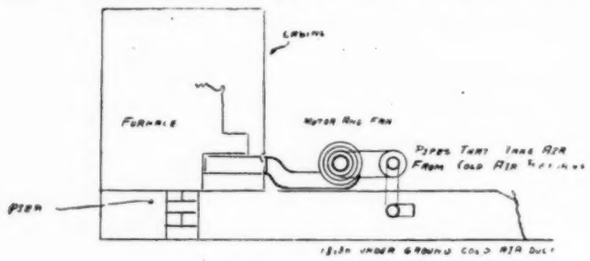


Figure 3.—Side View of Booster.

Second Floor.

86 × 40 × 10 = 34,400 cubic feet.
34,400 × 3 = 103,200 cubic feet.
103,200 ÷ 60 = 1,720 cubic feet.
1,720 ÷ 600 = 2 5/6 or 400 square inches.

Total pipe area, 1,200 square inches.

Their office records also show the job as having been checked by the B. t. u. method as well.

The principal feature about this installation is the Excelsior Booster system, same being so arranged as not to interfere with the gravity circulation, thereby avoiding any possibility of destroying or injuring the warm air furnace when the booster is shut off.

Each job is figured on a determined air change per hour, depending upon what kind of a building it is and the B. t. u. loss determines the number of changes.

The warm air furnace under those conditions may be allowed to burn as much as eight or nine pounds of coal per square foot of grate per hour, without injuring the heater or causing fire hazard.

This contract came to the company upon a direct recommendation from another church job furnished by it in 1919, and also installed by Mr. Raymo.

The Excelsior Company claims that this method will heat a building in one-third of the time and at a very material saving in fuel.

The accompanying illustration shows the Booster in place. It can be furnished for any make of furnace and is applicable to churches, schools, auditoriums, theaters, stores, residences, factories and foundries. The company is prepared to make layouts and will be glad to cooperate with those who may have problems of like character.

There are hundreds of large size jobs that are now giving only fair results that can be turned into big successes by the aid of the booster.

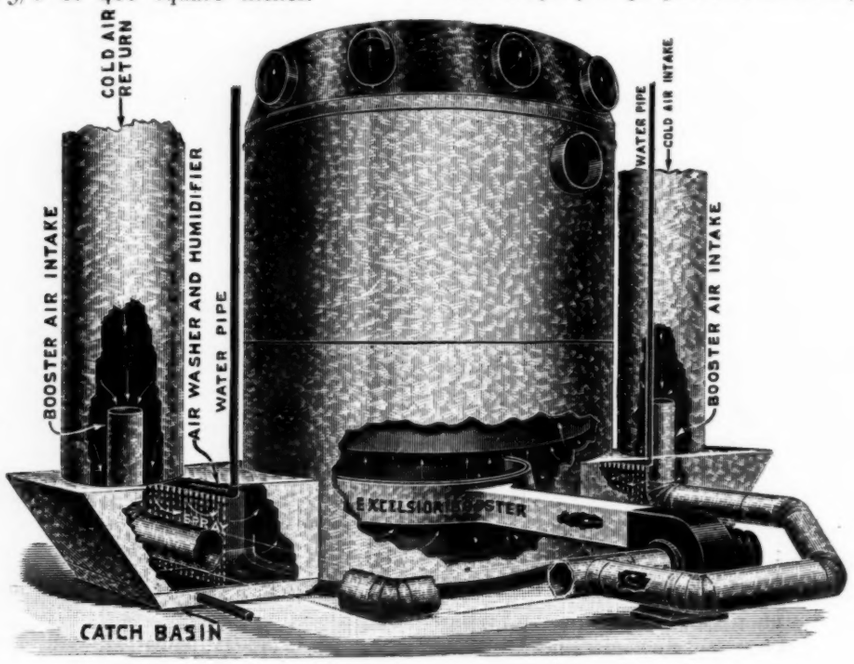


Figure 4.—Skeletonized View of Excelsior Booster for Warm Air Furnace.

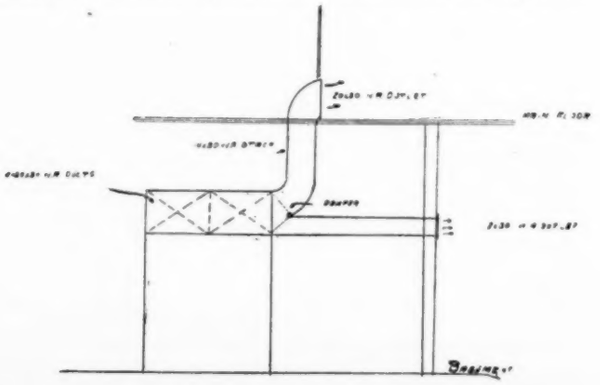


Figure 5.—Details of Warm Air Ducts.

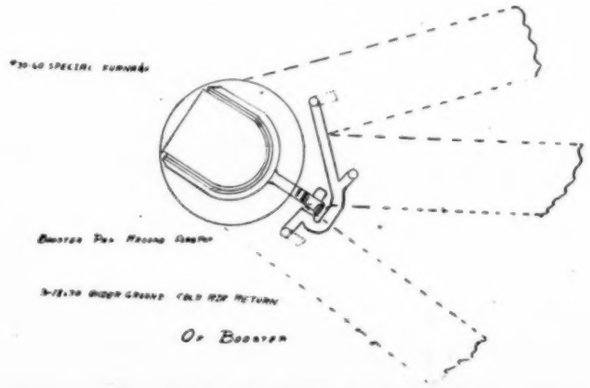


Figure 6.—Top View of Booster.

Questionnaire When Properly Answered Will Help Installer to Avoid Most Common Complaints.

The Replies Will Also Make It Easier for Him to Plan the Installation in Most Efficient Manner.

In the following are given some of the most important points of information which the installer of warm air furnaces should have, in order that he may avoid the more common complaints which are made after the installation has been completed.

They form a part of the questionnaire which is furnished by the Engineering Department of the Haynes-Langenberg Manufacturing Company, St. Louis, Missouri.

With them came a sheet of paper ruled off in small squares on which the basement plan may be sketched and two thin tracing sheets for the upper floors.

The instructions and questions follow:

Instructions.

First Floor.

1. Draw plan of first floor on the ruled sheet. If the building is more than 30x40 feet allow a square to represent one square foot (scale ⅛ inch equals one foot). If smaller, allow four squares (red lines) to each one square foot. (Scale ¼ inch equals one square foot). With pen or pencil show shape, size and relative location of each room. Locate partitions, windows, outside and inside doors, chimneys and fire places. Be sure to locate halls and closets even though they will not be heated. Show location of all pieces of furniture that would interfere with the placing of registers. Mark place where you would prefer to have register located with "X." Name the rooms and give points of compass. Show here height of ceiling.... ....feet.....inches.

Second Floor.

2. Draw the second floor (if any) on the middle tissue sheet, tracing the corresponding walls and partitions, and fill in other details. Mark location of beds and other pieces of furniture that can not easily be moved. Also location of fixtures in the bath room. Name the rooms, give dimensions, locations of windows and doors and mark rooms that are not to be heated as in first floor. Mark places where you would like register to be located by "X." Give height of ceiling here.....feet.....inches. If sloping roof give average height.

Basement.

3. After completing sketches of first and second floor trace on the top tissue sheet a plan of the cellar or basement. Give inside dimensions and indicate any part not excavated. Locate chimneys, piers, girders, partitions, walls, stairs and outside entrance. Indicate location of windows. Also of what material basement floor is constructed. Give location of Laundry, Fruit Cellar, Coal Bin, etc., and where you would like furnace to be located also what direction the feed door should be faced. Show here height of basement floor to bottom of joists.....feet.....inches.

4. Unless otherwise specified Black Japanned Baseboard warm air registers and oak floor cold air faces will be figured for residences and Black Japanned floor faces for other buildings.

Please Answer Each Question Below:

1. What is size of chimney inside measurement?...
.....

2. Does chimney extend to basement? .....

3. Is there any other flue opening in furnace chimney? .....

4. Is chimney straight to highest point or does it bend over fire place? .....

5. Is chimney as high as highest part of building?
.....

6. What fuel will be used? .....

7. Which way does the stairway run? (mark on plan by arrow).

8. Where are cellar stairs? (mark on plan).

9. Which way do joists run on both floors (mark on plan).

10. Of what material are the division walls of cellar made? .....

11. Of what material is house constructed? .....
.....

12. If wood—is it sheathed and papered? .....

13. If brick, stone or concrete—is it solid or hollow walls? .....

14. Does building stand alone or is it protected by other buildings? .....

15. If protected—on which sides and to what extent? .....

16. Has the building storm doors and storm windows? .....

17. Are the doors and windows weather stripped?
.....

18. Are there any open fire places? .....How many? .....

19. Do you expect to use them after the furnace is installed? .....

20. Are there girders or double joists in basement supporting inside walls (show on sketch by dotted line).

21. Are girders supported by brick piers or wooden posts? (mark location on sketch).

22. Are sidewall or floor registers preferred?.....
.....what finish?.....

23. Do you know if City Ordinances require double air cooled wall stacks or single wall pipes?.....
.....

24. Do you want estimate submitted for furnace installed or just material? .....

25. What is the name and address of your furnace dealer? .....
.....

Answer These Additional Questions if House Is Already Built.

26. Will second floor pipes be exposed or concealed in partitions? .....

27. If exposed do you want them encased and with what material? .....

28. If upstairs rooms are all bed rooms would you prefer to heat them with ceiling registers? .....

29. If necessary to place furnace in pit (because cellar is not deep enough) would there be any danger of seep water? .....

30. Is there a furnace now in the building? .....

Answer These Additional Questions if There Is an Old Furnace in Building.

31. Mark on plan location and size of registers now installed both warm air and cold air. Measure inside of grill not outside of border.

32. Mark on plan location and diameter in inches of warm air, cold air and smoke pipes.

33. Are cold air ducts of wood, galvanized iron, or underground? .....

34. Are any additional rooms to be heated, if so which? .....

35. Does the old furnace satisfactorily heat each room? If not, which? .....

36. Are the pipes and registers apparently in good condition? .....

Answer the Following Additional Questions Regarding Church Plans.

37. Is auditorium floor straight or sloping? ..... If sloping—in which direction? .....

38. Give extreme height of auditorium also average height if sloping roof.....

39. Give location of aisles, pulpit, altars, rails, etc. (on plan).

40. Give height of ceiling of all side rooms and state whether floors are level with auditorium floor (on plan).

41. Are side rooms connected with rolling partitions? .....

42. If so do you want separate registers or will they be heated from auditorium?.....

43. If basement is to be heated will it ever be used the same time as auditorium? (if so a larger furnace will be required) .....

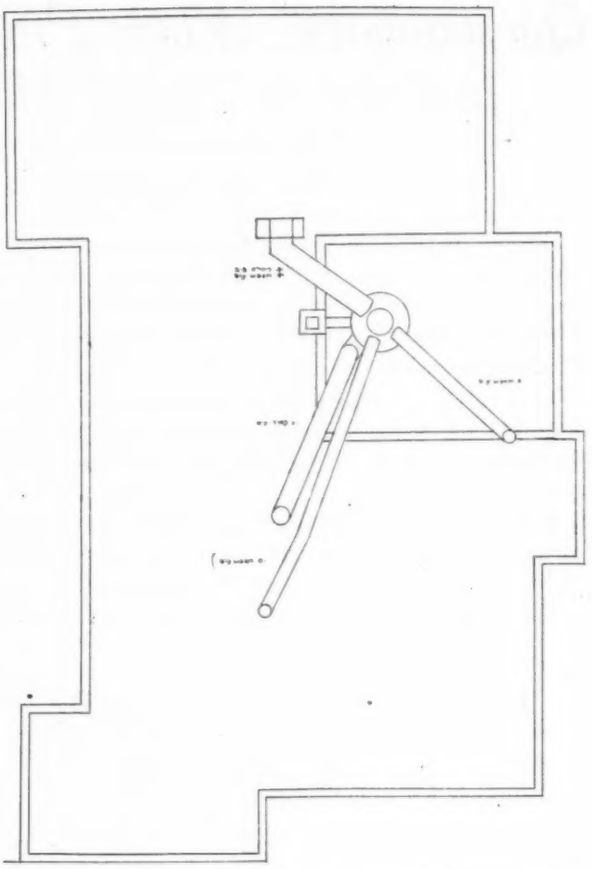
Combination of Duplex Register with Separate Warm Air Runs.

In the accompanying illustrations are shown the plans for a warm air furnace installation where a Majestic Duplex Register was used in connection with two separate warm air runs and an extra cold air return.

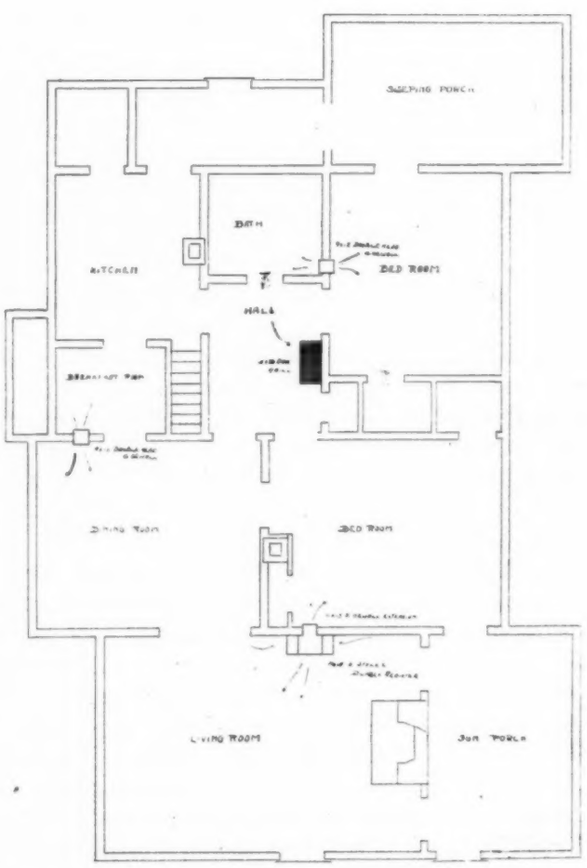
It will be noted that such an installation takes care of all the rooms except the kitchen and does not fill up the basement with pipes.

These plans were furnished by the Engineering Department of the Majestic Company, Huntington, Indiana, manufacturers of Majestic warm air furnaces, Duplex registers, coal chutes, garbage receivers, etc.

It is stated by the company that with their Duplex register there is much less friction in the air travel, thus necessitating less heavy firing, which means longer life for the fire pot and other parts of the warm air furnace. Tests are said to prove that although the Duplex register occupies 46 per cent. less floor space it will pass 75 per cent. more heated air than the floor type register.



Basement Plan for Installation of Warm Air Furnace With Duplex Register and Extra Warm Air Runs and Cold Air Return.



Main Floor Plan of Duplex Register Installation Showing Location of Extra Cold Air Face and Additional Warm Air Register.

Wrong and Right Way of Installing a Warm Air Furnace.

In the following we show two ways of installing a warm air furnace—the first illustration shows how not to do it, while the second shows a method of installation which will produce satisfactory results.

The illustrations are shown by courtesy of the Forest City Foundry and Manufacturing Company, Cleveland, Ohio, and the following is taken from a pamphlet recently published by this company. The statements made can be used as a guide by any installer who desires to give his customers good service.

Three of the most important mistakes made in installation of warm air furnaces are:

Mistake Number 1. To set the furnace *anywhere* in the cellar.

Mistake Number 2. To take the cold air from the basement.

Mistake Number 3. To put a small throat register box to a base board register on the first floor.

To remedy mistakes Number 1 and Number 3, set the furnace where it will, as near as possible, equalize the length of all pipes running off of same, and be sure you have large enough pipes

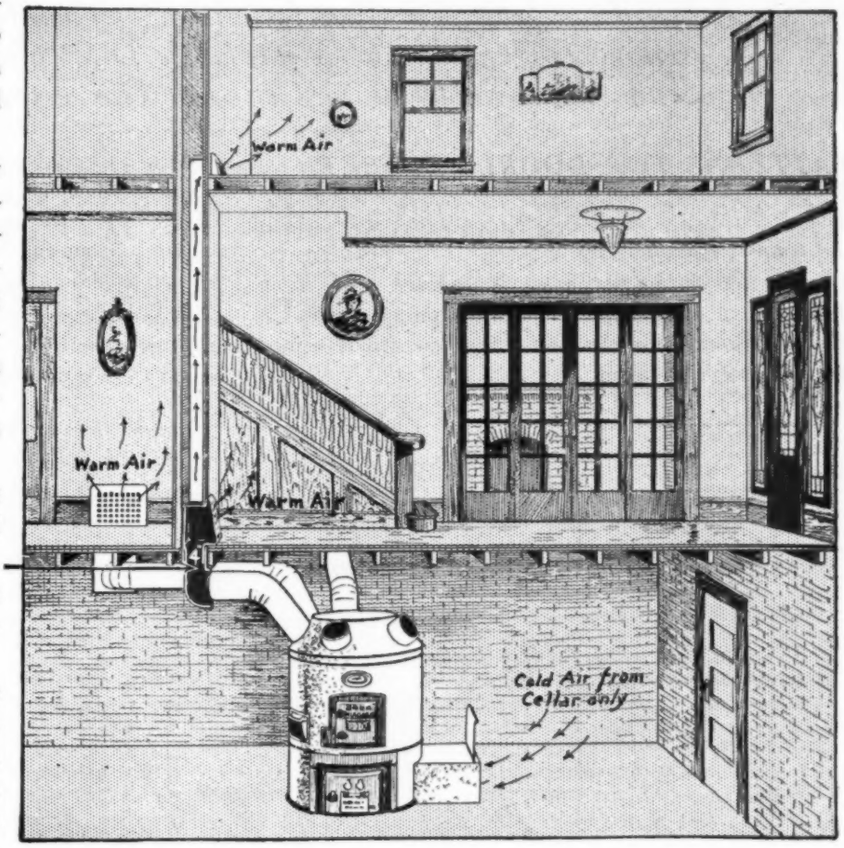


Figure 1. Wrong Way of Installation. Note Small Throat Register Box and No Cold Air Return.

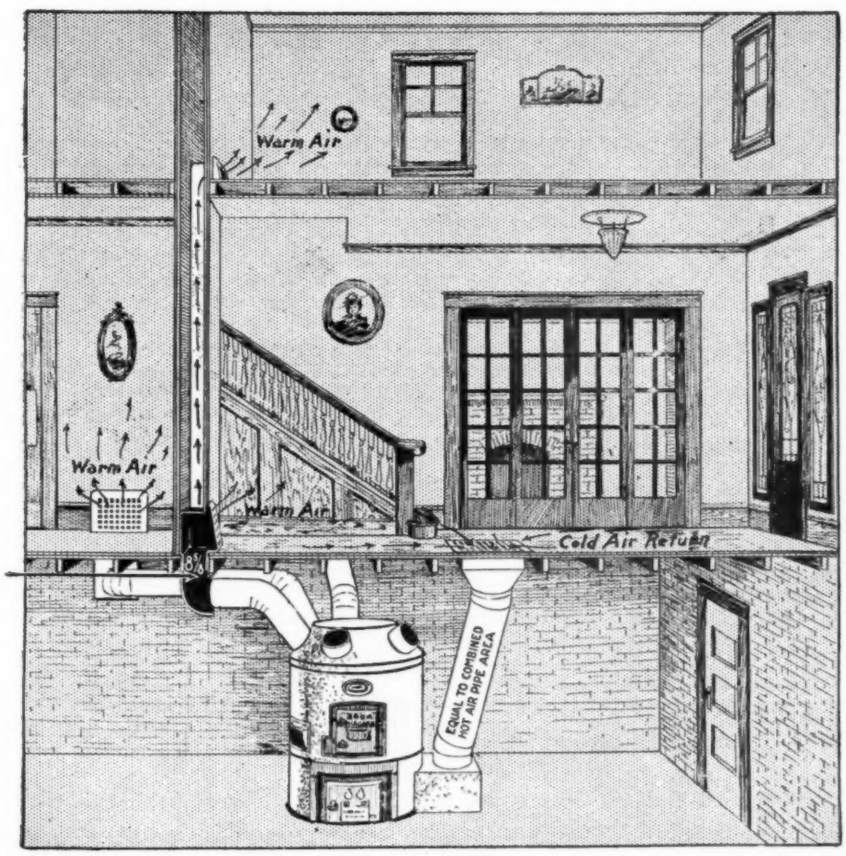


Figure 2. Right Way of Installation. Note Large Throat Register Box and Cold Air Return.

to deliver enough air to each room to heat the room properly without having to deliver it at more than double the temperature at the register face, that is desired in the room. For example, if the room is to be heated to 70 degrees, the air at the face of the register should be only 140 degrees, or in other words, should not be obliged to deteriorate more than 50 per cent. in distribution.

Mistake Number 2, of taking the air out of the cellar through an opening in the casing is like trying to put two gallons of water in a one-gallon jug, without having an overflow. As the air in the basement and living rooms is about equal in pressure before any fire is built in the furnace, you are simply trying to take the air out of the basement and compress it in the rooms above, which is simply a great waste of energy and heat units, and one can not generate heat units without fuel.

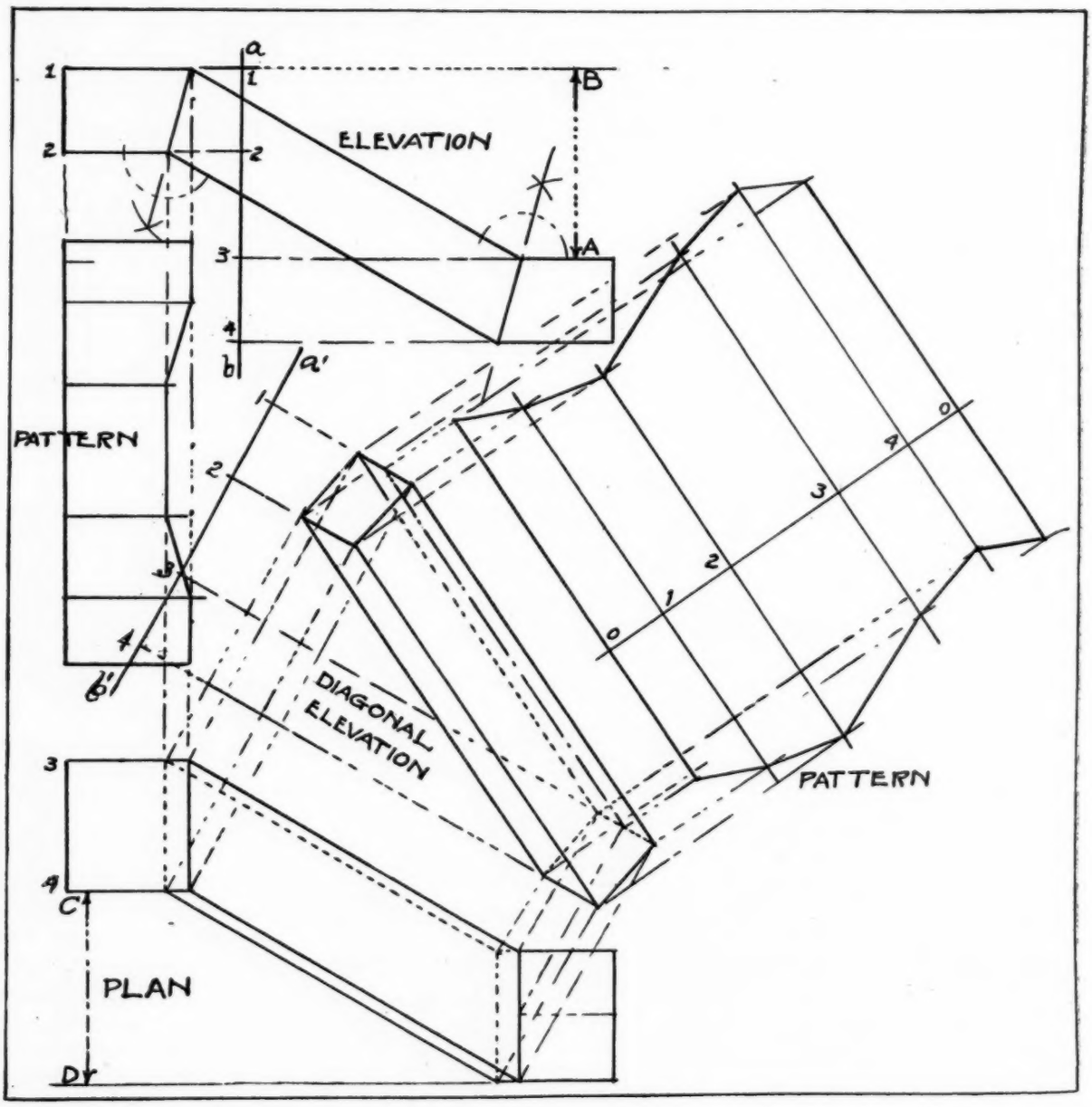
Practical Helps for Tinsmiths

No Two Jobs Are Exactly Alike. Therefore, the Sheet Metal Worker Has to Meet Each Difficulty as It Comes. Send Your Problems to Us. Let Our Experts Help You.

PATTERNS FOR DOUBLE OFFSET.

By O. W. Kothe, Principal St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

In various forms of piping, in furnace work or in heating and ventilating, or other piping systems, it happens that a connection must be made, where a pipe has rise and also offset.



Patterns for Double Offset.

The elevation shows the rise as A-B, and the plan shows the offset C-D. Now the idea is to develop the middle piece so a proper fit will be made.

So we first draw the elevation letting 1-2 be the width of pipe and A-B be the rise. With this we detail the elevation making the length to suit.

Next bisect the angles and determine the miters as shown. From the first angle the pattern can be developed as shown below elevation.

Now to develop the plan, drop lines from the heel and throat of miter lines into plan, placing the offset line at C-D to suit measurements, and that will enable drawing the plan as shown. Now as neither the elevation nor the plan is a true length, we must develop a diagonal elevation.

So for this we draw a line across elevation as a-b,

and we extend the heel and throat lines from the top and bottom angles to this line, as in points 1-2-3-4.

Next we place this line as a′-b′ with all its points at right angles to the middle piece of plan. From each of these points as 1-2-3-4 project lines parallel to the middle piece of plan, and then from each point in the miter lines of plan, square out points so they are parallel with a′-b′. At the intersections thus made, we develop the diagonal elevation as shown.

From this elevation the pattern for the middle piece can be set out by setting the girth as O-O and projecting the miter cuts from the miter lines of diagonal elevation as shown. Laps for seaming or riveting must be allowed extra.

Gives Method for Laying Zinc Roofs.

To American Artisan and Hardware Record:

We have read with interest the letter from "A Sheet Metal Worker" of Montana under date of December 3rd, inquiring about the method of laying zinc roofs.

As you know, within the past year we have brought into the market the "Illinois Zinc Shingle," which has been designed to overcome the structural and architectural defects of all other metal shingles. A metal worker with ordinary intelligence can apply it correctly on any roof that is adapted to shingles of any kind. A specially designed joint between the shingles allows for contraction and expansion so that leakage is not possible no matter how severe the changes in weather may be. Being made of *pure zinc the* shingle will never rust and its pre-oxidized finish which is a beautiful soft gray will match any color scheme. Painting is not necessary.

We are sending you an Instruction Sheet which we will be glad to have you forward to this Sheet Metal Contractor. From these instructions you will notice how easily "Illinois Zinc Shingles" are laid. The first course is laid at the bottom starting at the left corner and working to the right. Each succeeding course is handled the same and we find that "Illinois Zinc Shingles" can be laid quicker than any other good roofing material in ordinary roofing work.

We are also enclosing our blue print showing the method of using zinc on a batten style roof. This style of roof is used extensively in European countries where there are many zinc roofs over 100 years old. One of the mill buildings of the Illinois Zinc Company has been covered with a zinc roof for 34 years and this roof is still in good condition despite the fact that it is subjected to sulphuric acid fumes from our adjoining acid plant.

Illinois Zinc Corrugated Sheets are adapted to roofing and siding work where any corrugated sheets are required. These corrugated zinc sheets are made in the standard sizes and are being extensively used on permanent building work where galvanized material has not stood the test.

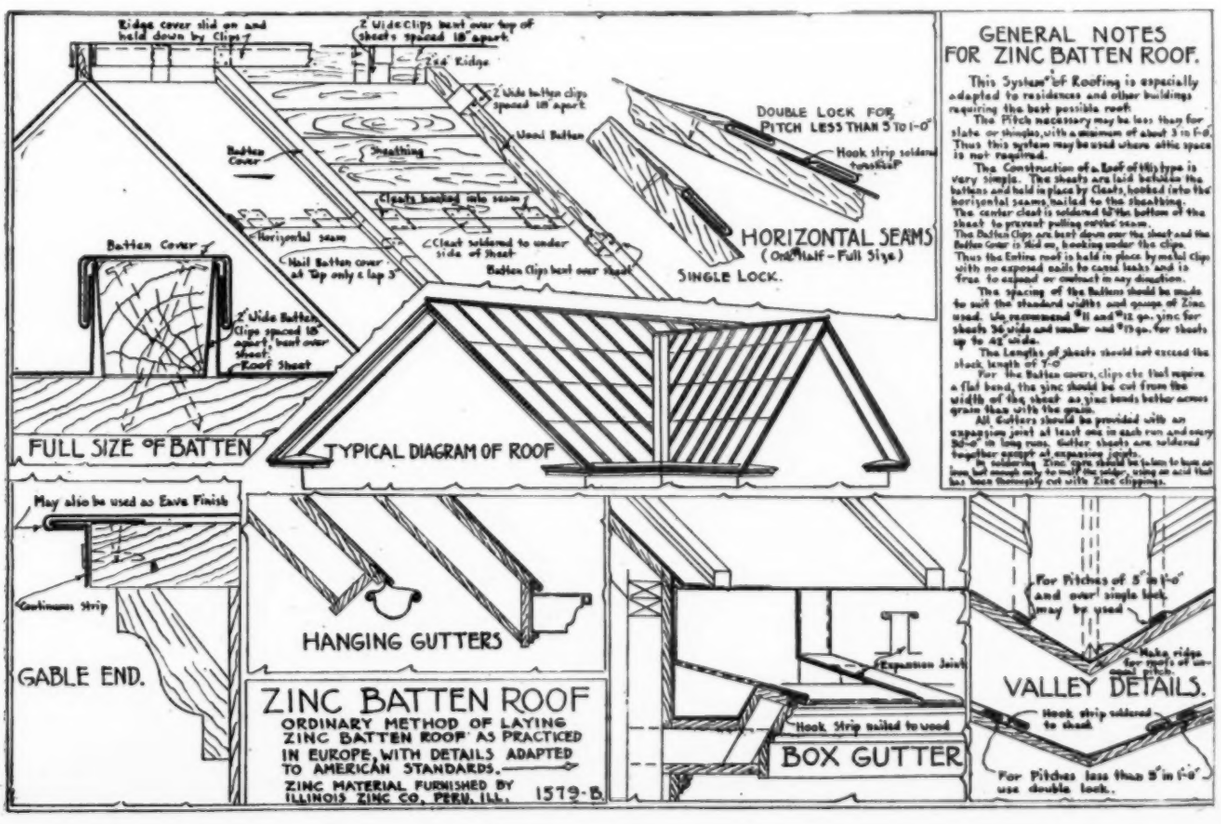
The American Zinc Institute at 27 Cedar Street, New York City, is always pleased to give complete information about zinc for roofing and we understand they are now compiling a Sheet Metal Worker's Hand Book which will give complete technical details of the use of Zinc for all kinds of roofing.

Yours very truly.

Illinois Zinc Company.
E. S. GELLATLY,
General Sales Manager.

New York City, December 19, 1921.

The directions given on the accompanying illustration are herewith reproduced in type for the sake of clearness:


GENERAL NOTES FOR ZINC BATTEN ROOF.
This System of Roofing is especially adapted to residences and other buildings requiring the best possible roof.
The Pitch necessary may be less than for slate or shingles, with a minimum of about 3 in 1-0. Thus this system may be used where attic space is not required.
The Construction of a Roof of this type is very simple. The sheets are laid between the battens and held in place by Cleats, hooked into the horizontal seams, nailed to the sheathing.
The center cleat is soldered to the bottom of the sheet to prevent pulling out the seam.
The Batten Clips are bent down over the sheet and the Batten Cover is slid on, hooking under the clips.
Thus the Entire roof is held in place by metal clips with no exposed nails to cause leaks and is free to expand or contract in any direction.
The spacing of the Battens should be made to suit the standard widths and gauges of Zinc used. We recommend #11 and #12 gauge zinc for sheets 36" wide and smaller and #13 gauge for sheets up to 48" wide.
The Lengths of sheets should not exceed the stock length of 7-0
For the Batten covers, clips etc that require a flat bend, the zinc should be cut from the width of the sheet as zinc bends better across grain than with the grain.
All Gutters should be provided with an expansion joint at least one in each run and every 50'-0" in long runs. Gutter sheets are soldered together except at expansion joints.
In soldering Zinc care should be taken to have an iron hot enough only to melt the solder, using an acid that has been thoroughly cut with Zinc clippings.
Ridge cover slid on and held down by Clips
2" Wide Clips bent over top of sheets spaced 18" apart
2x6 Ridge
2" Wide batten clips spaced 18" apart
Wood Batten
Sheathing
Batten Cover
Cleats hooked into seam
Horizontal seam
Cleat soldered to under side of sheet
Batten Clips bent over sheet
Nail Batten cover at Top only & lap 3"
2" Wide Batten Clips spaced 18" apart, bent over sheet
Roof Sheet
DOUBLE LOCK FOR PITCH LESS THAN 3 IN 1-0"
Hook strip soldered to roof
HORIZONTAL SEAMS (One-Half - Full Size)
SINGLE LOCK.
FULL SIZE OF BATTEN
TYPICAL DIAGRAM OF ROOF
May also be used as Eave Finish
Continuous strip
GABLE END.
HANGING GUTTERS
ZINC BATTEN ROOF
ORDINARY METHOD OF LAYING ZINC BATTEN ROOF AS PRACTICED IN EUROPE, WITH DETAILS ADAPTED TO AMERICAN STANDARDS.
ZINC MATERIAL FURNISHED BY ILLINOIS ZINC CO. PERU, ILL. 1579-B
Expansion Joint
Hook Strip nailed to wood
BOX GUTTER
For Pitches of 5" in 1'-0" and over single lock may be used
Make ridge for roofs of unusual pitch.
VALLEY DETAILS.
Hook strip soldered to sheet
For Pitches less than 5" in 1'-0" use double lock.

General Notes for Zinc Batten Roof.

This system of roofing is especially adapted to residences and other buildings requiring the best possible roof.

The pitch necessary may be less than for slate or shingles, with a minimum of about 3 inches in 1 foot. Thus this system may be used where attic space is not required.

The construction of a roof of this type is very simple. The sheets are laid between the battens and held in place by cleats, hooked into the horizontal seams, nailed to the sheathing. The center cleat is soldered to the bottom of the sheet to prevent pulling on the seam. The batten clips are bent down over the sheet and the batten cover is slid on, hooking under the clips. Thus the entire roof is held in place by metal clips with no exposed nails to cause leaks and is free to expand or contract in any direction.

The spacing of the battens should be made to suit the standard widths and gauge of zinc used. We recommend No. 11 and No. 12 galvanized zinc for sheets 36 inches wide and smaller and No. 13 gauge for sheets up to 42 inches wide.

The lengths of sheets should not exceed the stock length of 7 feet.

For the batten covers, clips, etc., that require a flat bend, the zinc should be cut from the width of the sheet as zinc bends better across grain than with the grain.

All gutters should be provided with an expansion joint at least one in each run every 50 feet in long runs. Gutter sheets are soldered together except at expansion joints.

In soldering zinc care should be taken to have an iron, hot enough to melt the solder, using an acid that has been thoroughly cut with zinc clippings.

With Nine Million Automotive Vehicles in Use the Prospects Are Excellent for Radiator Repair Work.

During the Five Years of Utility of the Automobile the Average Expense for Radiator Repairs Is About Three Hundred Dollars.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, New York City.

FIFTEENTH ARTICLE.

With nine million automotive vehicles in use throughout the country, the amount of work involved in repairing radiators, and the amount of business transacted in selling replacement radiators, is enormous.

While there are a few car owners who will pride themselves on having a radiator with which they had no trouble ever since they first got their car, the great majority of the owners will indignantly blame their radiator for most of the troubles and for the most frequent expenses they have.

The facts are that the automobile, the life of which it is said to be five years, will incur an average radiator expense of about three hundred dollars during these five years.

The repairing of breaks and leaks in the radiator will amount to about one-half of the total.

And the other half will be expended either for new radiators or, in localities where there is a competent re-coring shop, for new cores.

In Fords, the total radiator bill will be less. In expensive cars and in trucks, it will be considerably more.

At this average, the automobile owners of the country would expend *five hundred and forty million dollars* each year, for replacement radiators and radiator repairs alone.

The figure sounds high, but listening to those who pay radiator repair bills, the amount of sixty dollars per radiator, per year, appears a mere joke.

Now, granted that the round sum expended by the country for replacement radiators, for new cores inserted and for other radiator repairs, does not reach above half a billion dollars annually, the question is *who is getting that money?*

Is the sheet metal worker, the tinner, the repair solderer who is maintaining a shop in the immediate neighborhood of thousands of car owners, getting any of it?

Are the hardware people who maintain a store for the purpose of carrying in stock and dealing with anything made of sheet metal, getting it?

In sections of the country where there is no shop doing radiator repairing, that money is being divided up between the automobile dealer who persuades the owner to buy a new radiator every time the used one leaks, and the auto repair mechanic or garage man who is getting his commission on the exorbitant prices charged for repairs in the city, where he is sending the radiators to be repaired.

Many radiators are being sold locally, through dealers. Many of them are being ordered directly, from makers advertising in the popular automobile journals.

Be it as it may, the car owner is disgusted with having to pay the full price of a radiator each time it springs a leak.

He distrusts the dealer who sells him the radiator.

He is equally distrustful of the auto mechanic and the garage man who offers to send the radiator away.

He knows that neither of them knows anything about radiators, and that he is asked to pay for something which neither of them is able to guarantee—even if they would.

Because, their guarantee is no good if it involves weeks of delay in getting the radiator back.

Can there be a better opportunity for the hardware store maintaining a tin shop, or the sheet metal man maintaining a store, than this?

The combination is mentioned purposely.

In order to make the best of the opportunity, both

the repairing of old radiators and the selling of new radiators should be in one.

The car owner will trust the man who is capable of repairing his old radiator, *to know something about radiators,* and, if a new radiator must be bought, to tell which one it should be—and guarantee it.

The guarantee will mean at least something.

At least it will mean, that the new radiator, should it leak shortly after being put to work, will be repaired promptly at a cost not too high.

The combination is desirable for other reasons, too.

The man who knows something about radiators is not liable to deal in any junk offered him.

He will discriminate between what he knows to be a good radiator and one that is not.

Selling those radiators only, which he will *know* to be good, he will presently kill the competition of those cheap makes of radiators now sold through garages, auto repair shops, tire and vulcanizing shops, pottery and furniture stores.

He will be known in his locality as *the* radiator man, and the money expended in that locality for radiators and radiator repairs will be handled by *him.*

For the hardware store maintaining a tin shop and for the sheet metal shop maintaining a store, the combination of repairing old radiators and of selling new radiators in place of those that are beyond repair, is a practical one.

They are able to carry a stock of cores for the most frequently repaired radiators.

The carrying in stock of such new radiators as Fords, Buicks, Overlands, Dodges, Maxwells, or any of the radiators used on the cars most represented in their locality, with facilities of getting other makes quickly, and at the best of dealers' prices, is just as practical as the carrying in stock of implements or conductor pipes and, as yet, there is more in it.

No exorbitant prices need to be charged.

There is money in radiators, both in selling them and in repairing them, at a reasonable profit.

And even if the multiple commission and otherwise inflated city prices should be charged for repairs, the car owner still would be better off not having to pay for shipping and re-shipping and storing his car while the radiator is on its way to and from the city.

Once there is a combination of a radiator repair shop in connection with a store keeping in stock new cores and new radiators for the popular cars, all the radiator repair work and the trade in new radiators will become centered in it.

However, in order to be able to do that, the hardware people and the sheet metal man *must know radiators.*

They must learn to repair them.

They can not repair radiators efficiently except they learn their construction, their relation to the motor, their working order, their disorderly state, their defects, the peculiarities of their cores.

That is why, in these articles, we are writing for the man who *would learn*; that is why, in these articles, we are acquainting him with *everything* he needs to know.

That is why, in these articles, the reader will find the radiator discussed from every angle.

The tubular constructions, their good and bad features.

The cellular constructions, their advantages and defects.

And, finally, why the one will work satisfactorily where the other will not.

By knowing every one of the constructions, the repairer will be competent to repair them all.

By knowing them, he is able to tell which is good and which is not; which will do for this motor or service, and which for the other.

Being in the business of repairing radiators, he will be competent to do the repairing right.

Being in the business of buying and inserting cores, he will buy the good ones and insert them well.

And being in the business of selling new radiators, eventually, he will know something about them and sell those only which he will be able to guarantee.

(To Be Continued.)

Ohio Auxiliary Has Sixty-Two Members and Is Still Growing.

F. F. Foster, secretary of Jobber's and Salesman's Auxiliary to the Sheet Metal Contractors' Association of Ohio, reports the rapid growth of the Ohio Auxiliary since the organization July 21st, 1921, at Dayton, Ohio, during the Sheet Metal Contractors' Convention. He writes us as follows:

The new roster just published contains sixty-two names of representatives of wide awake business firms calling on the sheet metal contractors of Ohio. It is our aim to enroll the representatives of all firms selling to the Ohio sheet metal contractors as well as to encourage the Association of all contractors with the Ohio Sheet Metal Contractors' Association.

"We believe every sheet metal contractor of Ohio, large or small, is benefited by belonging to both a local and state Association and that every jobber and salesman should be interested in the welfare of the sheet metal contractors to the extent of promoting his organization by becoming a member of the Ohio Auxiliary."

A letter or card addressed to Mr. Foster at his office, 108 W. Fifth Avenue, Columbus, Ohio, will bring you the necessary information for becoming a member of the Ohio Auxiliary.

Salesmen's Auxiliaries Promote Good Fellowship.

The greatest progress is made when there is a common understanding and participation in a common purpose.

To this end it is of the utmost importance that the spirit of good fellowship be fostered in business.

Correctly interpreted, there is really no conflict of rights and profits in an industry or trade where each one recognizes that his welfare depends upon the general welfare of the industry.

It has been proved hundreds of times that business people thrive more surely and pleasantly when they carry the practice of good fellowship into every department of their own business and into all the relations of their business with the manufacturer, jobber, and salesman.

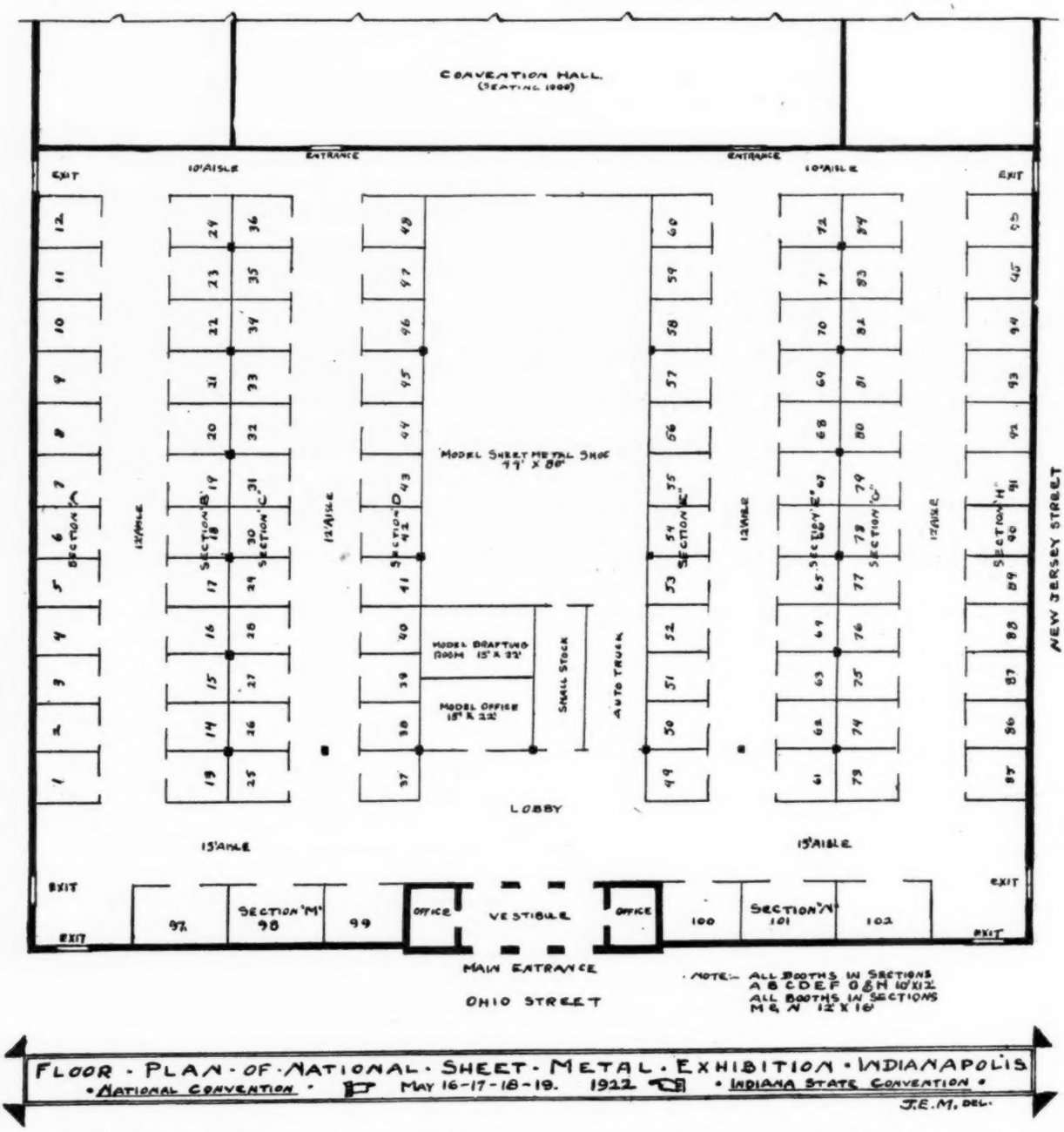
Plans Are Rapidly Being Completed for Great Sheet Metal Exhibition.

Indianapolis, Indiana, Will Have Honor of Being First City Where Comprehensive Exhibition of Sheet Metal Products and Tools Will Be Held.

The plans for the exhibition which is to be held in connection with the Annual Convention of the National Association of Sheet Metal Contractors, May 16th to 19th inclusive, 1922, at Indianapolis, Indiana, are practically completed.

The layout of the exhibition provides for 102 booths, all of which except six on the Ohio Street side of the building measure 10x12 feet, the six being 12x16 feet.

In the center there will be a model sheet metal shop, 44x80 feet in size, completely equipped; there will also



Floor Plan of National Exhibition of Sheet Metal Products, Machinery and Tools. To Be Held May 16, 17, 18 and 19, 1922, at Indianapolis, Indiana.

The Cadle Auditorium has been secured for the Convention and the Exhibition, the latter occupying a space approximately 180x200 feet in the auditorium hall, while the sessions of the Convention will be held on the stage which has plenty of space for seating one thousand persons.

be a model drafting room, 15x22 feet and a model office, 15x22 feet, with a stock room for small items and space for an auto truck.

"Traffic" arrangements have been worked out by which all of the booths will be on "Main Street" so that no matter where a manufacturer's exhibit is lo-

cated, he will have a fair opportunity for interesting the visiting sheet metal contractors in his line of goods.

Although up to this time no real campaign for the sale of exhibition space has been carried on, it is stated by those in charge that more than half of the booths have already been spoken for.

The Auxiliary will finance the entire expenses of the Convention and Exposition, and the banquet and other entertainment features will be provided by the Auxiliary.

Ralph R. Reeder, secretary of the State Association, will have charge of the program for the business sessions of both State and National Association.

The Indianapolis men who are responsible for this great enterprise are as follows:

Joseph Gardner and Ralph R. Reeder, president and secretary respectively of the Indiana Sheet Metal Contractors' Association.

C. W. Fryberger and Frank Doyle, representing the Indianapolis Sheet Metal Contractors' Association.

E. W. Norman, president, H. A. Beaman, secretary, and Joseph Mattingly, Exhibit Director of the Jobbers' and Traders' Auxiliary of the Indiana Sheet Metal Contractors' Association.

T. A. Wilkening is Publicity Director, and J. C. Henley is Director of Finance.

It is easy to understand that with these men in charge, so much progress has already been made with the arrangement for this, the first real exhibition of articles used by the progressive sheet metal contractor.

Incidentally, many of the Indianapolis concerns are giving helpful publicity to the forthcoming convention by carrying on their letterheads the following subline:

"18th Annual Convention of Sheet Metal Contractors and Exposition of Sheet Metal Products, Indianapolis, May 16, 17, 18 and 19, 1922."

When a job gets too big for you don't be backward about calling in help. There is no merit in sticking to it alone until it is too late to be helped.

Exterior View of Dadle Auditorium, Corner Ohio and New Jersey Streets, Indianapolis, Indiana, Where 18th Annual Convention of Sheet Metal Contractors and Exhibition of Sheet Metal Products Will Be Held May 16, 17, 18 and 19, 1922.

Notes and Queries.

Summer Fronts for Fireplaces.

From J. O. Hubeli, Neoga, Illinois.

Will you please inform me who manufactures summer fronts for fireplaces?

Ans.—Colonial Fire Place Company, 4631 West 12th Street, Chicago, Illinois; Fred J. Meyers Manufacturing Company, Hamilton, Ohio; Fanner Manufacturing Company, Cleveland, Ohio; S. M. Howes Company, 42 Union, Boston, Massachusetts.

Horse Shoes.

From Doonan Brothers, Holland, Minnesota.

Kindly inform us who makes the regulation playing horse shoes, also who makes the polished steel shoe.

Ans.—1. Fruin Drop Forge Company, 347 Root Street, Chicago, Illinois; Phoenix Horse Shoe Company, 209 South La Salle Street, Chicago, Illinois; Diamond Calk Horse Shoe Company, Duluth, Minnesota. 2. American Steel and Wire Company, 208 South La Salle Street, Chicago, Illinois, make both kinds.

"Chapin" Planes.

From Ruud and Knain, Northwood, North Dakota.

Who manufactures "Chapin" planes?

Ans.—Chapin-Stevens Company, Pine Meadows, Connecticut.

Address of Secretary of American Society of Heating and Ventilating Engineers.

From C. R. Coulter, Sesser, Illinois.

Kindly give me the name and address of the secretary of the American Society of Heating and Ventilating Engineers.

Ans.—C. W. Obert, 29 West 39th Street, New York City.

Percolator Handles.

From McGowan Brothers Hardware Company, Spokane, Washington.

Who manufactures percolator handles?

Ans.—Bogert and Hopper, Incorporated, 57 Barclay Street, New York City; H. A. Stiles and Company, 93-97 Oliver Street, Boston, Massachusetts.

Weekly Report of the Markets

General Conditions in the Steel Industry. Review of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

TRIES WATER TRANSPORTATION FOR STEEL PRODUCTS.

The result of the recent experiment in water transportation for steel products by the Jones & Laughlin Steel Company was made public recently by S. E. Hackett, sales manager, in an address before the Cincinnati Chamber of Commerce.

Mr. Hackett said, "We gathered in our first orders and assembled the material and loaded it in steel barges of our own and on October 27 our first argosy set sail for Southern points, to deliver our products in Huntington, Louisville, Evansville and St. Louis.

"We have now shipped a total of 12,000 tons of steel products, the equivalent of 400 freight carloads and it is our intention to keep this water transportation service going right along, and in time we may be able to extend its benefits to customers in Gulf ports and even in Pacific ports.

"The cheaper the transportation the wider the circle in which you can transact business.

"Waterways offer this cheap transportation and the city sitting on the banks of one of the great arms of America's wonderful inland waterways is fortunate indeed over her sisters inland."

At this meeting a committee was named to devise an adequate river terminal to handle heavy tonnage and a report will be submitted in a few days.

Steel plant operations this week will show a sharp falling-off. It would not be surprising if the output of steel ingots by the leading interest should fall to 30 per cent. of capacity and that of the independents to 25 per cent. of capacity but even if production is temporarily curtailed to this extent, the prospect is that the Steel Corporation activities for the month of December will average 45 per cent. of capacity which means an output of about 850,000 tons of steel, being less than in either November or October but larger than in any preceding month since March.

Assuming the December estimate to be correct, the corporation will have produced a little over 10,500,000 tons of ingots during the year.

Independent steel plants as a whole, while not operating more than 25 per cent. during this holiday week —and some of them have suspended ingot production entirely—are likely to produce 800,000 tons of steel during the entire month.

This is at an average rate of about 32 per cent. for the month, indicating a total yearly production of about 9,000,000 tons.

It will be recalled that while the independent companies have a larger aggregate capacity than the Steel Corporation, they have operated throughout the year, with the exception of possibly October and November, at 10 per cent. to 15 per cent. less than the corporation.

When the corporation was drawing specifications from old contracts, few of the independent mills had back logs to help them over a lean period.

Early in July, when the corporation was operating 25 per cent. of capacity or more, the independents were down to 11½ per cent to 12 per cent. These facts account for the relatively, as well as actually, smaller output by the independents as compared with the Steel Corporation.

Steel.

Buying of steel by consumers, so far as this year's shipments are concerned, is over for the year and even for shipment over the first quarter of next year, there is much conservatism.

In January, however, the prospect is that there will be some increase in orders when it is realized that freight rates are not likely to be lowered until the beginning of the second quarter.

On the other hand, no free buying for future shipment can be expected while the tendency of prices is downward and the prospect is favorable for lower freight rates sooner or later.

Although the railroads are fighting reductions in freight schedules, producers as well as consumers of steel are just as determined that transportation charges shall be lowered.

It is equally apparent, however, that railroads should receive relief through a further reduction in the wage scale of employes.

Railroads, as well as other consumers of steel, are placing few orders at the moment and none of importance are expected until January.

Inquiries are still before the mills for considerable tonnages of rails, bars, plates and shapes for car construction but not a few of these inquiries are held in abeyance.

Orders for between 200,000 and 300,000 tons of rails are likely to be placed with the mills in January or February and car construction will call for at least 200,000 tons of steel.

Copper.

The domestic copper market remains quiet, while selling for foreign account continues. Prices are unchanged at 13⅞ cents for December, 14 cents for January and 14⅛ cents for February and March.

There are rumors to the effect that the mines of the Calumet & Hecla and subsidiary companies will resume by February, but no confirmation of this date is to be had.

It is estimated that the 1921 output of the Mohawk will be 14,000,000 pounds and that of the Wolverine more than 4,000,000 pounds.

A plan has now been effected whereby the Anaconda Copper Mining Company may take over the American Brass Company. The stockholders of the American Brass Company will shortly be offered $150 in cash and three shares of the Anaconda in exchange

for one share of American Brass and in all probability will be given until January 23 in which to effect the exchange.

The offer most likely will be conditional upon the deposit of at least 51 per cent. of the stock of the American Brass Company.

Since this plan was formulated the terms have been somewhat revised, as it now looks as though some additional financing will be necessary, which the United Metals Selling Company has offered to do.

The Anaconda has a total of 668,750 shares unissued and stockholders in the American Brass will be offered the right to subscribe to 233,125 shares on the basis of one share for each 10 shares owned. The additional stock will be underwritten by a syndicate at $50 a share.

Neither domestic nor foreign consumers are showing any special interest in the market temporarily, but while consumers' requirements are light, producers are not seeking business aggressively.

The statistical position is so wonderfully improved that producing interests are no longer concerned about the future.

The only disturbing factor is that some of the small producing companies in South America as well as in this country may increase output prematurely.

There are still about 200,000,000 pounds of blister copper as well as 450,000,000 pounds of refined copper in stock, enough to meet domestic and foreign requirements for four to six months.

Tin.

Tin has been under the influence of exchange and the London tin market.

Not a great deal of buying has been done by consumers in this country, but they have been a little more active than in the past year.

Sheet mills have been running on old stocks which are thought now to be reduced to the minimum safety allowance. The white metal appears to be well established above 30 cents a pound, specially if exchange continues recent strength.

Solder.

Prices of solder in Chicago continued unchanged during the week. Quotations in effect are as follows: Warranted, 50-50, per hundred pounds, $22.50; Commercial, 45-55, per hundred pounds, $20.75; and Plumbers', per hundred pounds, $19.50.

Lead.

A tone of quiet prevails in the domestic lead market, prices remaining firm.

The export trade has been revived, and so far this month 2,915 tons of lead has been shipped abroad.

Most of the Mexican production has been sent abroad for some time past, as the market over there has been much better than here, and stocks very low.

Sheets.

Reports from the Chicago market indicate that demand for steel sheets from domestic sources is light. Prices are holding firmly.

Except for export tonnages, principally from Japan, the market has little to offer.

The Inland Steel Company has closed its sheet department until January 3, when it will open at full capacity on business now on books and likely to be taken soon.

Zinc.

A decline of 10 points is recorded in the price of zinc slabs in the Chicago market. The present quotation is $5.30 per hundred pounds.

Tin Plate.

Recent irregularities in tin plate prices involved in a few mills making certain sales at 10 to 15 cents under the standard price of $4.75, do not seem to have disturbed the general market, and at the moment do not seem likely to precipitate another decline.

The mills in general remain strongly committed to the $4.75 price, which is quotable as the market in general.

It is pointed out in the trade that there are perhaps two or three sellers without as steady a line of trade as the average mill has acquired, and that such mills have had to buy their way into the market at times, while their slight price cutting does not disturb the general situation, or draw regular customers away from other mills.

Of course, no one can predict that the tin plate market will never break, but it does appear that if the recent price cutting were likely to precipitate a break it would have done so before this time.

WARM AIR FURNACE REGISTERS —.. —.

New discounts are announced this week for large and small cast and steel warm air furnace registers. These will be found in the present issue of AMERICAN ARTISAN AND HARDWARE RECORD under the heading of "Registers" in the department of "Current Hardware and Metal Prices."

Old Metals.

Wholesale quotations in the Chicago district which should be considered as nominal are as follows: Old steel axles, $13.50 to $14.00; old iron axles, $18.50 to $19.00; steel springs, $13.75 to $14.25; No. 1 wrought iron, $12.50 to $13.00; No. 1 cast, $12.00 to $12.50; all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 7½ cents; light brass, 4¼ cents; lead, 3¼ cents; zinc, 2 cents; cast aluminum, 9¼ cents.

Pig Iron.

Rogers, Brown & Company, Cincinnati, Ohio, says:

As was anticipated the holiday season is not affecting the pig iron market to the customary degree. There has been such limited purchasing for so long a time that buying for current needs is necessary to keep the wheels turning.

Foundries will enter 1922 with lighter inventories than they have shown for many years. Some very attractive lots of basic iron have been placed quietly by steel makers.

Many plants have taken advantage of the holiday and inventory season to curtail work even to the point of shutting down for a time, but they are looking ahead and quite a number of small inquiries for ferro alloys have come out in anticipation of heavier production in the first quarter.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry ...21 00 to 22 00
Southern Fdy. No. 2, 24 16 to 24 66
Lake Sup. Charcoal..31 50
Malleable 20 00

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$ 9 65
IX	14x20.....	11 05
IXX	14x20.....	12 30
IXXX	14x20.....	13 65
IXXXX	14x20.....	15 05
IC	20x28.....	19 30
IX	20x28.....	22 10
IXX	20x28.....	24 60
IXXX	20x28.....	27 30
IXXXX	20x28.....	30 10

COKE PLATES.

Cokes, 180 lbs....		20x28	$11 80
Cokes, 200 lbs....		20x28	12 00
Cokes, 214 lbs....	IC	20x28	12 35
Cokes, 270 lbs....	IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $3 38

ONE PASS COLD ROLLED BLACK.

No. 18-20.....	per 100 lbs.	$3 95
No. 22-24.....	per 100 lbs.	4 00
No. 26.....	per 100 lbs.	4 05
No. 27.....	per 100 lbs.	4 10
No. 28.....	per 100 lbs.	4 15
No. 29.....	per 100 lbs.	4 25

GALVANIZED.

No. 16.....	per 100 lbs.	$4 40
No. 18-20.....	per 100 lbs.	4 55
No. 22-24.....	per 100 lbs.	4 70
No. 26.....	per 100 lbs.	4 85
No. 27.....	per 100 lbs.	5 00
No. 28.....	per 100 lbs.	5 15
No. 30.....	per 100 lbs.	5 65

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs. $22 25

Commercial.
45-55 .....per 100 lbs. 20 75
Plumbers .....per 100 lbs. 19 50

ZINC.

In Slabs $5 30

SHEET ZINC.

Cask, lots 10c
Less than cask lots....10¼-10½c

COPPER.

Copper Sheet, mill base....$0 21

LEAD.

American Pig $4 85
Bar 5 60

Sheet.
Full coils.....per 100 lbs. $7 80
Cut coils.....per 100 lbs. 8 05

TIN.

Pig tin 36¼
Bar tin 38¼

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

ALARM CLOCKS.

	Per doz.
Big Ben and Baby Ben...	$28 80
America	13 56
Tattoo	28 50

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%

Winchester.
Smokeless Repeater Grade, ...10 & 4%
Smokeless Leader Grade, ...10 & 4%
Black Powder.....10 & 4%

U. M. C.
Nitro Club.....10 & 4%
Arrow .....10 & 4%
New Club.....10 & 4%

Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

Powder.	Each
DuPont's Sporting, kegs.	$11 25
" ¼ kegs.	3 10
DuPont's Canisters, 1-lb.	56
" kegs.	22 00
" ¼ kegs	5 75
" canisters	1 00
Hercules "E.C.," kegs.....	22 50
Hercules "Infallible," 25 can drums	22 00
Hercules "Infallible," 10-can drums	9 00
Hercules "E.C." and "Infallible," canisters	1 00
Hercules, W. A. 30 Cal. Rifle, canisters	1 25
Hercules Sharpshooter Rifle, canisters	1 25
Hercules Bullseye Revolver, canisters	1 00

ASBESTOS.

Paper up to 1/16.....10c per lb.
Millboard 3/32 to ⅛..10½c per lb.
Corrugated Paper (250 sq. ft.).....$6.50 per 100 lbs.
Rollboard .....11c per lb.

AUGERS.

Boring Machine 40 @ 40&10%

Carpenter's Nut 50%

Hollow.
Bonney's.....per doz. $30 00

Post Hole.
Iwan's Post Hole and Well .....30 and 5%
Vaughan's, 4 to 9 in., without handles per doz. $14 00

Ship.
Ford's .....Net

AWLS.

Brad.
No. 3 Handled...per doz. $0 65
No. 1050 Handled " 1 40
Patent asst'd, 1 to 4 " 85

Harness.
Common .....per doz. $1 05
Patent ..... " 1 00

Peg.
Shouldered ..... " 1 60
Patented ..... " 75

Scratch.
No. 18, socket Handled .....per doz. $2 50
No. 344 Goodell-Pratt, list less.....35-40%
No. 7 Stanley....per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz.....$14 50
Good Quality, Single Bitted, same weight, per doz. 13 00

BAGS, PAPER, NAIL

Pounds ..	10	16	20	25
Per 1000..	$5 00	6 50	7 50	9 00

BALANCES, SPRING.

Universal.
Sight Spring.....List less 25%
Straight .....List less 25%

BARS, WRECKING.

V. & B. No. 12.....$0 45
V. & B. No. 24..... 0 75
V. & B. No. 324..... 0 80
V. & B. No. 30..... 0 85
V. & B. No. 330..... 0 90

BEATERS.

Carpet.	Per doz.
No. 7 Tinned Spring Wire.	$1 10
No. 8 Spring Wire Coppered	1 50
No. 9 Preston.....	1 75

BELLS.

Call.
3-inch Nickeled Rotary Bell, Bronzed base..per doz. $5 50

Cow.
Kentucky 33⅓%

Door.	Per doz.
New Departure Automatic..Net	

Rotary.
3 -in. Old Copper Bell.....Net
3 -in. Old Copper Bell, fancy .....Net
2 -in. Nickeled Steel Bell..Net
3½-in. Nickeled Steel Bell..Net

Hand.
Hand Bell, polished..... List plus 15-10%
White Metal...List plus 15-10%
Nickel Plated.List plus 10%
Swiss .....Net

Miscellaneous.
Church and School, steel alloys 30%
Farm, lbs.. 40 50 75 100
Each $3 00 3 75 5 50 7 25

BEVELS, TEE.

Stanley's Rosewood handle, new list .....Nets
Stanley iron handle.....Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

Auger.
Jennings Pattern.....Net
Ford Car.....List plus 5%
Ford's Ship..... " " 5%
Irwin 35%
Russell Jennings.....Plus 15%
Clark's Expansive.....33⅓%
Steer's " Small list, $22 00..5%
" " Large " $26 00..5%
Irwin Car.....35%
Ford's Ship Auger pattern Car .....List plus 5%

Center 10%

Countersink.
No. 18 Wheeler's..per doz. $2 25
No. 20 " " 3 00
American Snailhead " 1 75
" Rose ... " 2 00
" Flat ... " 1 40
Mahew's Flat .... " 1 60
" Snail .. " 1 90

Dowel.
Russel Jennings .....plus 20%

Gimlet.
Standard Double Cut Gross $8 40
Nail Metal Single Cut .....Gross $4 00—$5 00

Reamer.
Standard Square....Doz. $2 50
American Octagon... " 2 50

Screw Driver.
No. 1 Common.....Each 18c
No. 26 Stanley.....Each 70c

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$8 90	$9 45	$5 40

Diston 30-in.

Nos.	6	66	26
	$9 45	$10 05	$9 45

BLOCKS.

Wooden 20%
Patent 20%

BOARDS.

Stove.	Per doz.
26x26, wood lined.....	$14 45
28x28, " "	16 95
30x30, " "	19 00
26x26, paper lined.....	8 15
28x28, " "	9 10
30x30, " "	10 80

Wash.
No. 760, Banner Globe (single) .....per doz. $5 25
No. 652, Banner Globe (single) .....per doz. 6 75
No. 801, Brass King, per doz. 8 25
No. 860, Single—Plain Pump 6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 60%
Carriage sizes larger and longer than ⅝x6.....50-10%
Machine, ⅝x4 and sizes smaller and shorter...60-10%
Machine, sizes larger and longer than ⅝x4.....50-5%
Stove 75-10%

Mortise, Door.
Gem, iron 5%
Gem, bronze plated.....5%

Barrel.
Cast .....Net
Wrought ..... "
Wrought, bronzed ..... "

Flush.
Wrought .....Net

Spring.
Wrought ..... "
Wrought, heavy ..... "

Square.
Wrought ..... "

BOXES.

Mail. No..	2	4	10
Per doz.	$18 00	$23 00	$29 00

Cast Iron.
Per doz. $9 50

Mitre.
Stanley's..... Net Prices
Stearns, No. 2..per doz. $48 00

BRACES, RATCHET.

Goodell-Pratt No. 408.....$4 60
" " No. 410..... 4 80
" " No. 412..... 5 00
V. & B. No. 444 8 in..... 4 65
V. & B. No. 333 8 in..... 4 30
V. & B. No. 222 8 in..... 4 00
V. & B. No. 111 8 in..... 3 50
V. & B. No. 11 8 in..... 3 05

BURRS, RIVETING.

Copper Burrs only..30% above list
Tinners' Iron Burrs only.....Net

BUTTS.

Steel, antique copper or dull brass finish — case lots — 3½x3½...per dozen pairs $2 75
4x4..... " " " 3 80
Heavy Bevel steel inside sets, case lots— .....per dozen sets 7 50
Steel bit keyed front door sets, each 1 80
Wrought brass bit keyed front door sets, each.... 3 25
Cylinder front door sets, each 7 00

CALIPERS.

Double .....Net
Inside and Outside..... "
Wing ..... "

CANS.

Milk.

Ohio. Gals.	5	8	10
Each	$3 65	$4 45	$4 70
Gem. Gals.	5	8	10
Each	$3 85	$4 95	$5 20
Jersey or Holstein. Gals.	5	8	10
Each	$4 15	$5 60	$5 90

CAN OPENERS.

See openers.

CARRIERS.

Hay.
Diamond, Regular...each, nets
Diamond, Sling ..... " "

CARTRIDGES.

See Ammunition.

CASTERS.

Standard—Ball Bearing, ...50 & 10%

Bed 40%

Common Plate.
Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S.....per doz. $12 25
No. 165S..... " 14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net $0 45
" " 10 lb. cans, " 90
" " 25 lb. cans, " 1 87
Asbestos, 5 lb. cans..... " 45
Pecora, 5 lb. cans..... " 45
" 10 lb. cans..... " 90
" 25 lb. cans..... " 1 87

CHAINS.

Breast Chains.
With Slide ....doz. pairs, $5 50
Without Slide.. " 5 06
Doubleslack ... " 9 35
With Covert Snaps " 6 28

Picture Chains.
Light brass, 3 ft..per doz. 1 25
Heavy brass, 3 ft. " 1 75

Sash Chain. (Morton's)

Steel, per 100 ft.
0 .....$2 50
2 ..... 2 10
1 ..... 3 60

Champion Metal.
0R 5 40
2R 5 60
1R 7 75

Champion Metal.—Extra Heavy.
1H $9 50

Cable Sash Chains.
Steel.....List Net Plus 15%

CHALK, CARPENTERS'.

Blue .....per gro. $2 00
Red ..... " 2 00
White ..... " 1 80
Common White School Crayon ..... " 0 30

CHIMNEY TOPS.

In bags.....per bag $1 80

CHECKS, DOOR.

Corbin .....Net list
Russwin .....Net list

CHISELS.

Cold.
Good quality, ⅝ in., each $0 44
" " ¼ in., " 0 28

Diamond Point.
V. & B. No. 15, ¼ in..... 0 23
V. & B. No. 15, ½ in..... 0 48

FIRMER BEVELLED.

Berg's (Swedish).
½-inch.....per doz., $4 45
1 - " ..... " 7 15
1½- " ..... " 10 15
2 - " ..... " 17 15
2½- " ..... " 26 95

Round Nose.
V. & B. No. 65, ¼ in..... 0 33
V. & B. No. 65, ½ in..... 0 44

SOCKET FIRMER.

Berg's (Swedish).
½-inch.....per doz., $11 95
1 - " ..... " 16 75
1½- " ..... " 23 95
2 - " ..... " 35 95

Cape.
V. & B. No. 50, ⅜ in..... 0 29
V. & B. No. 50, ¾ in..... 0 64

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers.....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CHURNS.

Anti-Bent Wood, Gal.	5	7	10
Each	$3 00	4 60	4 85

Belle, Barrell.....65 & 7½%

Common Dash, Gal.	5	7
Per doz.	$17 00	19 00

CLAMPS.

Adjustable.
Martin's 30%
No. 63, Screw.....20%

Cabinet.
Screw 20%

Carpenters'.
Steel Bar..List price plus 20%

Carriage Makers'.
2½-inch.....per doz. $ 7 00
5 - " ..... " 14 00
8 - " ..... " 28 00
12 - " ..... " 42 00

Quilt Frame.
No. 30, Ball and Socket, 2¼ in. head..per gross $13 00
No. 50 Ball and Socket, 3½-in. head..per gross 14 50

Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20

Saw Filers.
Wentworth's, No. 1, $12.50; No. 2, $18.25; No. 3, $16.25.

CLAWS, TACK

Wood hdl. No. 10..per doz. $1 15
Forged steel, wood hdl. " 2 15
Solid steel ..... " 3 25
Giant ..... " 50

CLEAVERS.

Family.

Beatty's, inch..	7	8	9	10
Per doz.	$25 10	27 50	30 50	33 50

CLEVISES.

Malleable .....10c lb.

CLIPPERS.

Bolt (Carolus).
No. 0.....$2 50
No. 1..... 3 25
No. 3..... 4 25

CLIPS.

Axle .....65&5%

Damper.
Standard .....per doz. 70c
Troy ..... " 38c

Hame ..... " 50c

COLLARS, STOVE PIPE.

Lacquered.

Inches.....	5	6	7
Fancy pattern, per doz.	65c	75c	$4 00

COMPASSES.

Carpenters' 15%

COPPERS—Soldering.

Pointed Roofing.
3 lb. and heavier...per lb. 40c
2 lb..... " 48c
2½ lb..... " 45c
1½ lb..... " 55c
1 lb..... " 60c

CORD.

Picture.
White Wire.....60 & 5%

Sash.
Spot No. 7.....per lb. 65c
Common, No. 7..... " 40c

COTTERS, SPRING.

Til sizes 87½%

COUPLINGS, HOSE.

Brass.....per doz. $2 25

CRADLES, GRAIN.

Morgan's Grapevine per doz. $45 00

CUT-OFFS

Standard gauge.....35%
26 gauge.....20%

CUTTERS.

Glass.
Red Devil.....Net

Meat.

Enterprise—Nos.	5	10	12
Each	$2 50	$4 25	$3 75
"	Nos. 22	32	
	$6 50	$8 50	

Pipe.

Saunder's, Nos.	1	2	3
Each	$1 85	2 75	6 75

Slaw and Kraut. Per doz.
4-knife Kraut.....$20 00-55 00
3-knife Kraut, 8x27 in. 13 00-18 00
1-knife Slaw..... 2 50
2-knife Slaw..... 3 00

Washer 11 00

DAMPERS, STOVE PIPE.

Diamond.
6-inch .....per doz. $1 50

DIGGERS.

Post Hole.
Eureka.....per doz. $15 75
Iwan's Split Handle (Eureka)
4-ft. Handle..per doz. 15 00
7-ft. Handle..per doz. 20 00
Iwan's Hercules pattern, per doz. 18 00
Dividers, Wing 25%

DRILLS.

Bench.
Blacksmiths' Twist (New List) 40%

Breast.
Millers Falls No. 12, per doz. $52 50
Millers Falls No. 112, per doz. 32 00

Hand.
Goodell's Automatic.
No. 01.....each $1 60
No. 03..... " 2 00
Goodell-Pratt No. 4½.each 3 00
Goodell-Pratt No. 379. " 4 00

Reciprocating
Goodell's ..... " 3 20

DRIVERS, SCREW.

Standard .....Nets
Lock Ferrule ..... "
Clark's Interchangeable.... "
Goodell's Spiral ..... "
Yankee Ratchet ..... "
" Spiral ..... "

EAVES TROUGH.

75-10% of Standard List.
Milcor .....Net

ELBOWS—Conductor Pipe.

Galvanized Steel, Tin and Terne
Plain Round or Round Corrugated
2 to 6 inch, Std. gauge..60-10-5%
2 to 6 inch, 26 gauge...40-10-5%
2 to 6 inch, 24 gauge...15-10-5%
Milcor .....Net

Square Corrugated.
Standard gauge.....45-10-5%
26 gauge 30-10-5%
Milcor .....Net

ELBOWS—Stove Pipe.

1-piece Corrugated, Uniform.

	Doz.
5-inch	$1 45
6-inch	1 50
7-inch	2 00

Uniform, Collar Adjustable.

	Doz.
5-inch	$1 90
6-inch	2 00
7-inch	2 40

ENAMEL.

Per doz.
Black Silk Air Drying.
No. 1, ½ pt. can with brush $1 90
No. 2, 1 pt. can with brush 2 50

Wire Screen Enamel.
Black Silk (Black only).

	Per doz.
½ pt. friction top can	$2 00
1 pt. friction top can	3 00
1 qt. friction top can	5 40

FACES, WOOD.

50% off list.

FASTENERS, STORM SASH.

Shroeder's .....per doz. $1 50
Sensible ..... " 3 00

FENCING.

Lawn fence, single space, 36-inch .....$ 9 12
Lawn fence, single space, 42-inch 10 20
Lawn fence, double space, 36-inch 12 50
Lawn fence, double space, 42-inch 13 75
Field fence, 26-inch, No. 10 top and bottom 12 filling 26 50
Same, 6 filling..... 33 82
Field fence, 32-inch, No. 10 top and bottom 12 filling 30 24
Same, 6 filling..... 39 41

FILES AND RASPS.

Heller's (American) 60-5%
American 60-5%
Arcade 50-10%
Black Diamond 50-5%
Eagle 50-10%
Great Western 50-10%
Kearney & Foot.....50-10%
McClellan 50-10%
Nicholson 50-10%
Simonds 60%
J. Barton Smith.....50-10-5%
X F .....Net List

FIRE POTS.

Clayton & Lambert's—each .....$4 00@$6 00
Gate City .....each 6 25
Gem .....each 36 75@ 8 50

GALVANIZED WARE.

	Per doz.
Pails (Competition), 8-qt.	$2 00
10-qt.	2 35
12-qt.	2 50
14-qt.	2 30
Wash tubs, No. 1	6 50
No. 2	7 50
No. 3	8 50

GARAGE DOOR HARDWARE.

Stanley .....All net

GAUGES.

Cream Pail.
Fairmount .....per doz. $3 75

Marking, Mortise, etc. .....Nets

Wire.
Disston's 25%

GIMLETS.

Discount .....65% and 10%

GLASS.

Single Strength, A and B, all sizes 31%
Double Strength, A and B, all sizes 33%

GLOVES.

	Per doz.
6-oz. knit wrist gloves	$1 00
8-oz. knit wrist gloves	1 20
10-oz. knit wrist gloves	1 45

GLUE.

Bulk.

B Amber	per lb.	35c
A white	"	40c
H. S. Amber	"	32c

Liquid.
Army & Navy 40%
Le Page's—
List "A" 37½%
List "B" .....35 %
List "C" .....25 %

GREASE, AXLE.

Wood Boxes.
Frazer's .....per gro. $13 00
Hub Lightning 7 50

Wood Pails.
Frazer's, 15 lb. $1.00; 25 lb. $1.50 each.
Hub Lightning, 15 lb. 90c; 25 lb. $1.21 each.

GRINDSTONES.

Family.

Inches	7	8	10	12

Prices on application.

Mounted.

Ball Bearing	1	2	3

Prices on application.

GUNS.

Iver Johnson Champion Single Barrel Shot Guns .....Net
Double Barrel, Hammerless ... "

HAFTS, AWL.

Brad.
Common .....per doz. $0 35

Peg.
Patent, plain top " 60
Patent, leather top " 80

Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

	Each, net
Blacksmiths, Hand, No. 0 26 oz.	$1 35
Engineers', No. 1, 26 oz.	1 35
Farriers', No. 7, 7 oz.	1 41
Machinists', No. 1, 7 oz.	1 06
Nail. Vanadium, No. 41½, 16 oz., each	1 56
V. & B., No. 11½, 16 oz., each	1 13
Garden City, No. 111½, 16 oz., each	94
Tinner's Riveting, No. 1, 8 oz., each	80
Shoe, Steel, No. 1, 13 oz., each	73
Tack. Magnetic, No. 5, each	1 00

HAMMERS, HEAVY

Farriers' 20%
Mason's,
Single and Double Face 50%

HANDLES.

Agricultural Tool.
4½-inch, plain ...per doz. $3 50

Auger.
Common Assorted, per doz. $0 75
Pratt's Adjustable, Nos. 1 & 2, per doz. 6 00
Ives' Adjustable ..per set 1 35

Axe.
Hickory, No. 1 ....per doz. 4 00
Hickory, No. 2 .... " 2 50
1st quality, second growth 6 00
Special white, 2nd growth 5 00

Chisel.
Hickory, Tanged, Firmer Assorted .....per doz. 55c
Hickory, Socket Firmer, Assorted .....per doz. 70c

Coal Pick 40%

Drifting Pick 40%

File, assorted .....per doz. 30c

Hammer and Hatchet.
No. 1, per doz. $0 80
Second growth hickory, per doz. 1 40

Hay and Manure Fork, Handles, Strap and Ferrule .....per doz. $7 00

Screw Driver.
Assorted .....each 6c

Shovel and Spade .....Net

HANGERS.

Door.
Matchless .....Net
Reliable .....Net
Richards 25%

Garage Door.
(See Garage Door Hdw.)

Conductor Pipe.
Iwan's Perfection 50%
Milcor Perfection .....Net

Eaves Trough.
Steel hangers 30%
Triple twist wire 10%
Milcor Eclipse .....Net
Milcor Triplex .....Net
Milcor Milwaukee .....Net

HASPS.

Hinge, Wrought, with staples Net

HATCHETS.

	Per doz.
Size No. 2 extra quality broad	$19 00
Competitive Grade	13 00 up
No. 2 Warranted Shingling	14 35
Competitive Forged	5 50

HAY RACK BRACKETS.

Wenzleman's No. 1 .....per doz. sets $18 00
Wenzleman's No. 2 .....per doz. sets 19 20

HINGES.

Blind.
Clark's Gravity
No. 1 .....per set 45c
No. 2 ..... " 88c

Gate.

Clarks	1	2	3
Hgs. & Ltch, ea.	85c	1 10	2 40

Hinges only—
Upper $1 25
Lower 1 55
Latches only—
No. 1 .....each 28c
No. 2 ..... " 28c

Screen Door.
1751—3x3 .....doz. $2 00
1753—2½x2½ ..... " 1 95

Spring.
Chicago .....Add 10% to list
Gem 25%
Matchless 40%
New Idea .....per gross $6 90

Wrought Iron.
Per 100 pairs with screws:
Light Strap Hinges, No. 3 $12 00
Heavy Strap Hinges, No. 4 15 75
Light T Hinges ....No. 3 12 10
Heavy T Hinges ...No. 4 20 00
Extra Heavy T Hinges, ...No. 4 21 50

Screw Hook and Strap.
6 to 12 in. ...per 100 lbs. $7 75
14 to 20 in. ... " " 7 50
22 to 36 in. ... " " 7 25

Screw Hook and Eye.
¾ in. .....per doz. pair $2 00
⅝ in. ..... " " 3 50
½ in. ..... " " 5 00

HOES.

Garden .....Net

HOOKS.

Awning, No. 60 .....Net

Belt.
Brown's .....70&5%
Jones' .....65&5%

Box.

No.	8	10	12
Each	$0 29	0 77	0 86

Bush.
Common Axe Handle, per doz. $20 00

Chain.

Inch	¼	5/16	⅜	7/16	½
Pr. 100	$7 60	8 10	9 75	11 50	12 60

Clothes Line.
Japanned ....per doz. 35c—1 00
Galvanized ... " 65c—2 25

Conductor.
Conductor hooks 20-10%
Milcor .....Net

Corn.
Common, riveted, red, per dz. Net
Little Giant ..... " "

Grass.

Common Nos.	1	3	5	7
Per doz.	$4 25	3 25	3 40	3 50

Hammock.
With plate .....per doz. $1 00
With screw ..... " 95

Picture .....50%&50%&10%

Potato and Manure Nets

HOSE.

	Per Ft.
¾-inch molded reel	13½c
¾-inch 3 ply duck	13½c
¾-inch 4 ply duck	16c
¾-inch 5 ply multiple	10½c

HUSKERS.

Boss.

Nos.	B	E
Per doz.	New Nets	
No. 59 .....per doz.	New Nets	

Plane.
Wood Bench ...Add 10% to list

IRONS.

Sad.
Charcoal .....per doz. $11 00
Common, polished, per 100 lbs. 7 75
No. 70 Asbestos .....$1 50 net
No. 100 " ..... 1 75 net
Common, nickel plated ... 8 25
Mrs. Pott's,
No. 50 J, Enterprise, per set Nets
No. 55 J, " " "
No. 50 T, " " "
No. 55 T, " " "

JACKS.

Wagon.
Richard's No. 1 ..per doz. $15 50

Oliver,

Each	$0 60	$0 80
Nos.	0	00

Standard,

Each	$0 60	$1 00
Nos.	1	2

Big Lift 40%
Tiger 40%

KETTLES.

Brass 15%
Cauldron .....40&5%
Copper .....per lb. 27
Maslin .....40&10%
Sugar 50%

KNIVES.

Beet Topping.
Clyde, 9-in. Scimiter Blade, doz. 25%
California 25%

Butcher.
Beechwood Handles, 6-inch blade 25%
Beechwood Handles, 7-inch blade 25%
Beechwood Handles, 3-inch blade 25%

Cooper's Hoop 25%

Corn.
Clipper 25%
Disston's No. 2 .....25%
Earle's 25%
Woodford 25%

Drawing.
Standard 25%
Adjustable 25%
Barton's Carpenters' 25%

Hay.
Iwan's Solid Socket 25%
Heath's 25%
Iwan's Sickle Edge 25%
Iwan's Imp'd Serrated 25%

Hedge.
Challenge 25%
Disston's No. 1 .....25%

Mincing.
Common, Single 25%
Common, Double 25%
Streeter, 4-blade 25%
Streeter, 6-blade 25%

Putty.
Common 25%
Landers 25%

Scraping.
Beech Handle 25%
Lander's 25%

KNOBS.

Door.

Mineral	per doz.	$2 00
Porcelain	"	2 00
Jet	"	2 00

LADDERS.

Step.
Common, per ft. 28c
Common, with Shelf, add 10c
IXL 34c
Challenge, 6 to 9 ft. 55c
10 to 16 ft. 60c

LANTERNS.

	Per doz.
Monarch tin, hot blast	$ 9 50
Dietz No. 2 cold blast	14 50
Best tubular	9 50
Competition lanterns No. 0 tubular	7 90

LEATHER, LACE.

Rawhide ⅜-inch ...100 ft. $2 00
" ½-inch ... " 4 00

LEATHERS, PUMP.

Valve and Plunger .....Net

LEVELS.

Disston, No. 28 Asst.	$22 05
" No. 18, 20 in. each	1 83
" No. 22, 24 in. each	2 40
" Shafting, 6 in.	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.	5 75
" No. 9 Asst.	12 40
" 24-26 in. each	1 02
" 28-30 in. each	1 00

LIFTERS.

Stove Cover.
Coppered .....per gro. $6 00
Alaska ..... " 4 75

Transom.
Payson's 55%

LINES.

Jute .....per lb.		25c
Sisal	"	35c
Cotton	"	25c
Braided Cotton	"	52c

LINING, STOVE.

Bricks .....per crate 42c

LOCKS.

Barn Door.
No. 60 Stearns..per doz. $12 00
No. 80 " .. " 24 00

MACHINES.

Riveting.
Stearns No. 1...per doz. $16 00
Tenoning.
No. 50 Peace's Spoke, each $16 00

MAIL BOXES.

See Boxes.

MALLETS.

Carpenters'.
Fibre Head, No. 2 per doz. $16 50
" No. 3 " 19 50
" No. 4 " 28 50
Round Hickory .....per doz. $3 00— 5 00
Round Lignumvitae " 6 25—10 50
Square Hickory " 3 50— 5 50
Square Lignumvitae " 8 00—12 00

Tinners'.
Hickory .....per doz. $2 25

MATS.

Door.
National Rigid.....5&10&5%
Acme Steel Flexible.....50%

MAULS.

Wood Choppers'.
Lake Superior & Oregon pat. .....40&5%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz.....Nets

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets....30%
Milcor .....Net

MOPS.

Cotton. Star (Cut Ends).
Pounds 12' 15' 18' 24'-3-oz.
Per doz. $4 00 4 35 5 50 7 00
Enterprise 16⅔%
Parker .....50&5%

NAILS.

Cut Steel.....$4 45
Cut Iron 4 45

Wire.
Common 3 65

Cement Coated.
Small Lots..... 4 20

Horseshoe.
Ausable .....55&5%
Capewell 15%
Perfect .....55&5%
Putnam .....20&5%
Star .....30&5%

Picture.
Brass Heads.....25%

Brads .....50&5%
Furniture .....List plus 15%

NAIL PULLERS.

See Pullers.

NAIL SETS.

See Sets.

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving....40%

NIPPERS.

End Cutting.
Berg's (Swedish) In. 5 6
Per dozen.....$12 60 15 20

End and Diagonal Cutting.
Berg's (Swedish) In. 5 6
Per dozen.....$10 05 13 00

Hoof.
Heller's .....40&10%
V. & B., No. 52, each.....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

NUTS, HOT PRESSED.

Square Tapped.
$2.41 off per 100 lbs.

Hexagon Tapped.
$2.41 off per 100 lbs.

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc 20%

Railroad.
Coppered 33⅓%

Steel.
Copper Plated 50-10-5%

OPENERS.

Can.
Delmonico .....per doz. $1 30
Never Slip ..... " 65

Crate.
V. & B. ...per doz. $7 25-11 00

OUTFITS, COBBLING.

Combination .....per doz. $16 00
Economy ..... " 8 50
Family ..... " 14 50

PAILS.

Cream.
14-qt. without gauge .....per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt. without gauge, ...per doz. 11 75

Sap.
10-qt., IC Tin....per doz. $4 00
12 " " " " 5 50

Stock.
Galv. qts. 14 16 18 20
Per doz.$9 75 10 75 12 75 14 50

Water.
Galvanized qts. 10 12 14
Per doz.....$5 75 6 50 7 25

Wood.
Cable, 2-Hoop....per doz. Nets
Cable, 3-Hoop.... " Nets
Cedar, 3-Hoop, brass " Nets

PANS.

Dripping .....Net

Fry.
Common .....Nets
Acme ..... "

Roasting.
Paxton,
Nos. 1 2 3 4
Per doz. .....Nets
Neverburn ..... "
Savory, No. 200..per doz. $8 40

PAPER.

Roofing. Per square
Major, 1-ply $1 33
" 2-ply 2 24
" 3-ply 2 65
Red Rosin.....per ton $111 45

Sand and Emery.
No. 1 per ream, best grade $5 40
No. 1, per ream, cheaper grade 4 25

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain " 8 40
Reading No. 78 " 11 40

Potato.
Goodell's Saratoga, 10½ in., doz. 6 50
Goodell's Saratoga, 5 in., doz. 5 50

PICKS.

Adze Eye Ore.....22½%
Drifting and Poll Picks....22½%
Plumbs, Railroad 22½%
Surface 22½%

PINCERS.

Carpenters', cast steel,
No..... 6 8 10 12
Each $0 56 $0 72 $0 93 $1 03
Blacksmiths', No. 10.....$0 96
Heller's .....List plus 10%

PINS.

Clothes.
Common, per box of 5 gro. $0 95

Picket.
Fluted, 15-in.....per doz. $1 10
Fluted, 21-in..... " 1 60
Spiral ..... " 1 90

PIPE.

Conductor.
Plain Round and Round Corrugated.
29 Gauge 55%
28 " 45%
26 " 35%
24 " 10%
Square Corrugated A and B and Octagon.
29 Gauge 40%
28 " 40%
26 " 30%
24 " 10%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.
Plain Round and Round Corrugated.
29 Gauge 40%
26 " 35%
24 " 10%
Square Corrugated A and B Polygon and Octagon.
29 Gauge 40%
26 " 30%
24 " 10%
14 and 16-oz. Copper, all designs 10%
Milcor, all styles and gauges..Net

Standard Gauge,
Crated and nested.....60-25%
Crated, not nested.....60-20%

Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not Nested .....60 & 10%
Nested solid .....60 & 15%

Stove. Per 100 joints.
26 gauge, 5 inch E. C. nested $14 50
26 gauge, 6 inch E. C. nested 15 50
26 gauge, 7 inch E. C. nested 17 50
28 gauge, 5 inch E. C. nested 12 50
28 gauge, 6 inch E. C. nested 13 50
28 gauge, 7 inch E. C. nested 15 50
30 gauge, 5 inch E. C. nested 11 00
30 gauge, 6 inch E. C. nested 12 00
30 gauge, 7 inch E. C. nested 14 00
T-Joint Made up.
6-inch .....per 100 $40 00

Furnace Pipe.
Double Wall Pipe and Fittings 45%
Single Wall Pipe, Round Pipe Fittings 45%
Galvanized and Back Iron Pipe, Shoes, etc.....45%
Milcor, galvanized .....Net

PLANES.

Stanley Iron Bench.....Net

PLIERS.

V. & B. No. 6.....each $0 57
" No. 7 Gas..... 0 60
" Double Duty 106.. 0 56
" Nut No. 3..... 0 64

Lineman's Side Cutting.
Berg's (Swedish), In. 6 7 8
Blk. Pol. Face, doz. $10 70 20 00 22 35

Long Nose Side Cutting.
Berg's (Swedish) In. 5 6
Blk. Pol. Face, doz. $12 25 15 20

Flat and Round Nose.
Berg's (Swedish)
Flat, In. 4 6 8
Blk. Pol. Face,
Doz. $8 90 13 35 19 65
Berg's (Swedish)
Round, In. 4 6 8
Blk. Pol. Face
Doz. $11 15 16 30 22 35

POINTS, GLAZIERS.

No. 1, 2 and 3.....per doz. 75c

POINTERS, SPOKE.

Stearns' No. 1....per doz.. $10 00
" No. 2.... " 12 00

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil hanl's " 1 10

POLISH.

Metal.	Per doz.
Black Silk No. 60—6 oz....	$ 1 50
Black Silk No. 70—1 pt....	3 00
Black Silk No. 80—1 qt....	5 00
Black Silk No. 90—1 gal...	12 00

Stove.	Per doz.
Black Silk No. 5 paste, 5 oz. can	$ 1 20
Black Silk No. 10 paste, ½ lb. can.....	2 00
Black Silk No. 10A paste, (fireproof), 1½ lb. can	1 50
Black Silk No. 15 paste, 1 lb. can	3 00
Black Silk No. 20 paste, 5 lb. can.....	11 40
Black Silk No. 6 liquid, 6 oz. can	1 35
Black Silk No. 8 liquid, ½ pt. can.....	2 00
Black Silk No. 12 liquid, 1 pt. can.....	3 00

PRESSES, FRUIT AND JELLY

Enterprise Manufacturing Co. 25%

PRUNERS.

Disston's Pole.....per doz. $18 00
Water's Improved, per doz. 60%

PULLERS.

Cork.
Daisy .....each $3 10
Phoenix ..... " 1 40
Quick and Easy.... " 2 70

Nail.
Giant .....per doz. $14 50
Never-Slip ..... " 17 00

PULLEYS.

Awning—Jap'd 10%

Clothes Line 10%

Hay Fork.
Iron Wheel, 5-in..per doz. $2 50
Wood Wheel, 6-in " 2 65
Wood Wheel, 6-in., pass knot ..... " 3 00

Sash.
Common .....Net
Common-Sense, 2-in.....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net

PUMPS.

Spray.
Midget Junior....per doz. $3 75
New Misty ..... " 6 00
Crescent ..... " 6 50

PUNCHES.

Conductors.
No. 22.....per doz. $3.00

Machine .....**per lb.** 25

Saddlers'.
Common...per doz. $1 50 to $5 00

Revolving Spring.
Stearns, No. 10..per doz. $ 8 00
" No. 40.. " 16 00
" No. 60.. " 19 00
Parker Metal Punch No. OX .....each $7 00
Whitney's Ball Bearing.. .....Prices on application

PUTTY.

Commercial Putty, 100-lb. kits $4 75

RAIL.

Barn Door.
Matchless, 1-in..... 5c
Matchless, 1¼-in..... 7c
Storm King 5c

Sliding Door.
Bronzed wrought iron, ...per ft. 8¼c

RAKES.

Garden	Per doz.
Steel, Bow, 12-inch Teeth	$8 50
Steel, Bow, 14-inch "	9 25
Malleable Iron, 12-in. "	4 75
Malleable Iron, 14-in. "	5 00

Hay.
Wood, 10 Teeth.....$4 00

Lawn.
30 Teeth .....per doz. 5 50

RAZORS—SAFETY

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 8 40
Gem (3 doz. lots).. " 8 00
Ever Ready ..... " 8 40
Ever Ready (3 dz. lots) " 8 00

RAZORS—STRAIGHT. RAZOR STROPS.

Star (Honing) 50%

REGISTERS.

Cast Iron 30%
Steel and Semi-Steel.....50%
Baseboard 50%
Adjustable Ceiling Ventilators 50%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated. 4x 6 to 14x14.....50%
Large Register Faces—Cast, 14x14 to 38x42.....65%
Large Register Faces—Steel, 14x14 to 38x42.....70%

REVOLVERS.

Iver Johnson Safety Automatic Hammer .....Net
Hammerless ..... "
I. J. Model 199..... "

RIDGE ROLL.

Galvanized.
Crated 70-25%
Wired 70-25-5%
Milcor .....Net

RINGS AND RINGERS

Pull.

Copper .....2½-in.	3-in.	
Per doz. $2 40	$2 65	
Rea's Improved Self-Piercing copper, ... doz. 3 40		
Steel, per doz..... 1 50	1 80	

Hog.

Blair's Rings.....per doz. $	75	
Blair's Ringers... "	1 00	
Brown's Ringers.. "	72	
Brown's Ringers.. "	1 00	
Hill's Ringers..... "	1 00	
Hill's Ring, boxes "	72	
Major Rings .... "	60	
Perfect Ringers... "	1 50	
Wolverine Rings.. "	1 10	
Wolverine Ringers "	1 10	

Fruit Jar.
White .....per lb. 80

Key.

Split, round.....per doz.	$0 17
Split, square..... "	32
Ball, round..... "	40

RIVETS.

Copper Belt....Add 15% to list
Coppered Iron 30%
Tinners' 30%

Hame.....per lb. $0 17

Slotted Clinch per doz. 60@1 10

Tubular.
Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

ROPE.

Cotton.
⅛, 5-16 in. Com. on reels, per lb. 80c
¼, 5-16 in. Com, in coils, per lb. 80c

Sisal.
1st Quality, base 12½c to 13½c
No. 2.....11c to 11½c

Manila.
1st Quality standard brands .....16½c to 17½c
No. 2.....15c to 15½c

Pure Manila.
1st Quality, base, per lb. .....17¾c to 18½c
Hardware Grade, per lb. 11½c

SAWS.

Butchers'.

Atkins	No. 2, 14-in.....	$12	20	
"	No. 2, 18-in.....	13	70	
"	No. 2, 22-in.....	15	25	
"	No. 7, 16-in.....	15	20	
"	No. 7, 20-in.....	17	30	
"	No. 7, 24-in.....	19	35	
"	No. 7, 28-in.....	21	40	
Disston's	No. 2, 14-in....	18	20	
"	No. 2, 18-in....	19	50	
"	No. 2, 22-in....	20	85	
"	No. 7, 16-in....	20	00	
"	No. 7, 20-in....	21	35	
"	No. 7, 24-in....	23	35	
"	No. 7, 28-in....	26	00	

Compass.

Atkins	No. 2, 10-in.....$	4	95	
"	No. 10, 10-in.....	5	10	
"	Blades, No. 2, 10-in.	2	95	
"	" No. 2, 10-in.	3	00	
Disston's	No. 20 Jackson.	4	00	
"	No. 40, Sampson	2	50	
"	No. 2 & 77, 10-in.	6	05	
"	No. 9, 10-in....	6	80	

Cross-Cut.

Atkins	No. 221, 4-ft.....	2	70	
"	No. 221, 6-ft.....	4	10	
"	No. 221, 8-ft.....	5	45	
Disston's	No. 289, 4-ft...	3	15	
"	No. 289, 6-ft...	6	15	
"	No. 289, 8-ft...	10	65	

Flooring.

Atkins	No. 96, 16-in.....	19	95	
"	No. 96, 20-in.....	21	85	
Disston's	D19, 16-in.....	24	50	
"	D19, 20-in.....	31	00	

Hand and Rip.

Atkins	No. 54, 20-in.....	17	75	
"	No. 54, 26-in.....	22	10	
"	No. 53, 16-in.....	16	45	
"	No. 53, 20-in.....	20	80	
"	No. 53, 24-in.....	24	20	
"	No. 53, 28-in.....	28	60	
"	No. 53, 30-in.....	31	95	
Disston's	No. 7, 20-in....	19	30	
"	No. 7, 32-in....	35	40	
"	No. 8, 16-in....	17	55	
"	No. 8, 20-in....	20	75	
"	No. 8, 24-in....	24	40	
"	No. 8, 28-in....	29	50	
"	No. 8, 30-in....	32	95	

Keyhole.

Atkins	No. 1, complete..	2	80	
"	No. 2, complete..	3	35	
Disston's	No. 5, complete	3	35	
"	No. 10, complete	3	70	
"	No. 95, complete	5	75	

Miter Box.

Atkins	No. 1, 4x20.....	29	70	
"	No. 1, 5x22.....	24	55	
"	No. 1, 6x22.....	38	35	
Disston's	No. 4, 4x20-in..	36	15	
"	No. 4, 5x22-in..	43	25	
"	No. 4, 6x22-in..	47	20	

Pruning.

Atkins	No. 20, 12-in.....	7	70	
"	No. 10, 16-in.....	16	50	
Disston's	No. 20.....	18	75	

Wood.

Atkins	No. 202.....	8	50	
"	No. 318.....	10	05	
"	No. 906.....	15	65	
"	No. 1509.....	18	40	
Disston's	No. 111, 30-in..	22	20	
"	No. 111, 32-in..	22	75	
"	No. 47, 30-in..	20	25	
"	No. 47, 32-in..	20	80	

SCISSORS.

Star 60%

SCOOPS.

Hubbard Western Pattern Riveted.

Size	A	B	C	D
1..	$16 75	16 00	15 25	14 45
4..	17 85	17 10	16 35	15 60
6..	18 65	17 85	17 10	16 35

SCRAPERS.

Box.
Triangular No. 6 per doz. $6 25

Road.

Cubic ft.	7	5	3
With runners, ea.	$7 00	6 50	6 20

SCREEN DOOR HINGES.

Cast iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Bench.

Iron, Ins.	1	1½	1	1½
	$6 82	7 87	9 45	16 80

Wood, white maple, per doz. 6 00

Hand—Wood 50%

Hand Rail 22%

Jack 30%

Lag or Coach—all sizes, gimlet pointed 60%

Saw—Centennial,

Nos.	1	2	3	4
Per doz.....	47c	55c	75c	90c

Wood.
F. H. Bright 77½-20%
R. H. Blued 75-20%
F. H. Jap'd 70-20%
F. H. Brass 72½-20%
R. H. Brass 70-20%

SCYTHES.

Clipper, Grass....per doz. $13 50
Honest Dutchman " 13 00

SETS.

Nail.

Square head.....per doz.	1	84
Cup point, knurled "	1	78

Rivet.

Farmers' .....per doz.	2	50
Tinners' 3-4	5	75
" 00-0	3	75

Saw.

Atkins No. 10....per doz.	$3	80
" No. 12..... "	6	20
Disston's Monarch No. 2..... "	9	90
Disston's Monarch No. 12 ..... "	13	20
Leach's ..... "		80
Nash's Hand .... "	3	15
Nash's X-Cut ... "	4	20
Stillman's Lever.. "	1	30
Stillman's X-Cut.. "	2	50
Whiting Pattern, No. 21 ..... "	7	50
Eccentric Anvil, Hand No. 395, N. P. Norrill Pattern ..... "	14	50

SHARPENERS, SKATE.

Diamond .....per doz. $1 60
Perfect 1 20

SHEARS.

	Per Doz.
Nickel Plated, Straight, 6"	$12 90
" " " 7"	14 85
" " " 8"	16 80
Japanned, Straight ....6"	11 00
" " ....7"	12 40
" " ....8"	13 80

SHEAVES, SLIDING DOOR.

Common.

Inches	3	4	5
Per set $1	40	1 75	2 40

Hatfield's.
Per set $1 80 2 10 2 75 25

SHELLERS, CORN.

Union .....per doz. $6 75

SHIELDS.

Expansion Bolt Shields.....60%

SHINGLES.

	Per Square
Zinc (Illinois) $15 00	

SHOES.

Conductor 60%

SHOT—See Ammunition.

SHOVELS AND SPADES.

Coal.
Hubbard's

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's

Size	A	B	C
14"	17 15	16 40	15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 85
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Snow.

Hubbard Special, Long Handle .....$	10 00
D-Handle	11 00
Sidewalk Scraper	6 50

Alaska Steel.

D-Handle .....per doz. $	3 50
Long Handle ..... "	3 00

SINKS.

Cast Iron.
Painted, 16x24 .....Net
Enameled, White, 16x24... "
Wrought Steel.
Painted, 16x24 ..... "

SKATES.

Ice.	Per pair
Key Clamp Rocker, Men's and Boys' — best steel runners, bright finish...	$0 91
Same—nickel plated finish	1 18
Key Clamp Hockey, Men's and Boys'—polished cast steel runners	1 24
Children's Extension Bob..	55
Half-key Clamp Rocker—Women's and Girls'....	1 15
Half-key Clamp Hockey—Women's and Girls'....	1 51
Racers, aluminum finish, including shoes	9 00
Hockey, aluminum	9 00
Both same prices for men's and women's.	

Roller.	
Ball Bearing—Boys'	1 85
Ball Bearing—Girls'	1 95

SNAPS, HARNESS.

Covered Spring .....Add 30%
Judd's Pattern Add 33 1-6% to list

SNATHS.

Double Ring Bush..per doz.	$9	75
Patent Loop, Bush.. "	10	00
Patent Loop, Grass. "	8	75

SNIPS, TINNERS'.

Clover Leaf .....40&10%
National .....40&10%
Star 50%
Milcor .....Net

SPRINGS, DOOR.

Perfect.

Nos.....	2	3	4	5	6	7
Per doz.	45c	50c	55c	65c	80c	90c

Reliance.

	Light	Medium	Heavy
Per doz...	$1 80	2 40	3 75
Torrey's .....per doz.		1	65

SPRINKLERS, LAWN.

Stearn's No. 1....per doz. $11 50

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Miter..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

SQUEEZERS, LEMON.

Common Wood.....per doz.	$0	70
Porcelain Lined, Wood "	1	25
Boss, malleable iron "	1	20
Iron frame porc'n bowl ..... "	1	90
Iron frame, glass bowl ..... "	2	35
Little Giant, tin'd iron ..... "	4	00
Drum, japanned ... "	3	60
Drum, nickel plated "	4	50

STAPLES.

Blind.
Barbed .....per lb. 21@22c
Butter, Tub ..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15
Netting.
Galvanized ....per 100 lbs. 6 50
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STEELYARD.

Discount 25%.

STONES.

Axe. Hindostan .....per lb.	New	Nets
More Grit .... "	"	
Washita ..... "	"	
Emery. No. 126.....per doz.	New	Nets
Oil—Mounted. Arkansas Hard No. 7 .....per doz.	New	Nets
Arkansas Soft "	"	
Washita No. 717 "	"	
Oil—Unmounted. Arkansas Hard per lb.	New	Nets
Arkansas Soft "	"	
Lily White ... "	"	
Queer Creek.. "	"	
Washita ..... "	"	
Scythe. Black Diamond per gro.	New	Nets
Crescent ..... "	"	
Green Mountain "	"	
LaMolle ..... "	"	
Extra Quinnebog ..... "	"	
Red End ..... "	"	

STOPS, BENCH.

No. 10 Morrill pattern .....per doz.	$11	00
No. 11 Stearns pattern ..... "	10	00
No. 15 Smith pattern "	7	00

STOPPERS, FLUE.

Common .....per doz.	$1	10
Gem, flat, No. 3... "	1	00
Gem, No. 1..... "	1	10

STRAPS.

Skate .....per doz. 85&1 20

STRETCHERS.

Carpet.

Bullard's	per doz.	$3 90
Excelsior	"	5 25
Malleable Iron	"	70
Perfection	"	6 30
King	"	4 50

Wire.

O. S. Elwood, No. 1	per doz.	Nets
O. S. Elwood, No. 2	"	"

SWIVELS.

Malleable Iron	per lb.	$0 10
Wrought Steel	per gro.	4 50

TACKS.

Bill Posters' 6-oz., 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb. 15½c

TAPES, MEASURING.

Asses' Skin ..... List&40%

THERMOMETERS.

Tin Case	per doz.	80c&$ 1 25
Wood Back	"	$2 00& 12 00
Glass	"	12 00

TIES.

Bale.

Single Loop, carload lots ..... 75&7%
Single Loop, less than car lots ..... 70&15%

TOOLS, SAW.

Disston's Universal 10%

TRAPS.

Game with Chains. Per doz.

Victor No. 1	$2 01
Oneida Jump No. 1	2 75
Newhouse No. 1	5 62

Mouse and Rat. List per gross.

Sure Catch Mouse Traps	$ 3 70
Vim Mouse Traps	3 70
Short Stop Mouse Traps	3 20
Wood Choker Mouse Traps, 4 hole	17 00
Sure Catch Rat Traps	16 00
Vim Rat Traps	16 00
Short Stop Rat Trap	15 00
Dead Easy Rat Traps	17 00
Star Rat Traps	50 00
Erie	54 00

Packed in One Bushel Band Stave Baskets. List per bushel.

Sure Catch Mouse Traps (360 Traps)	$ 9 30
Short Stop Mouse Traps (360 Traps)	8 00
Sure Catch Rat Traps (54 Traps)	6 00
Short Stop Rat Traps (54 Traps)	5 60

Assorted Mouse and Rat Traps. List per bushel.

Sure Catch (216 Mouse Traps and 26 Rat Traps)	$8 50
Short Stop (216 Mouse Traps and 26 Rat Traps)	7 50

TROWELS.

Cement.

Atkins No. 6	19 50
" No. 9	25 50
Disston's	30%

TRUCKS.

Bag	each $3 75
Warehouse or store, No. 1, each	$24 50
No. 2, "	22 50

TUBS, WASH.

Standard, Wood.				Ex.
Nos.	3	2	1	large
Per doz.	$9 50	11 25	12 75	15 50

Galvanized.			
No.	1	2	3
Per doz.	13 75	15 95	18 60

TWINE.

White Cotton.

Eureka, 4-ply ..... per lb. 30c

Jute.

3-ply and 6-ply Bale Lots. 22½c

VALLEY.

Formed Valley Galvanized Steel 60-5%
Milcor ..... Net

VISES.

No. 700, Hand, Inches	4½	5	5½
Doz.	$11 15	13 00	14 85

No. 701. In.	4	5	6
Doz.	$11 15	13 00	16 70

No. 1, Genuine Wentworth, Noiseless Saw ..... per doz. 15 00
No. 2, Genuine Wentworth, Noiseless Saw ..... per doz. 22 50
No. 3, Genuine Wentworth, Noiseless Saw ..... per doz. 20 00
No. 500, All Steel Folding Saw ..... per doz. 16 00

WASHERS.

Standard O. G. cast iron, per lb. 3¾c
Wrought steel in 5-lb. boxes, per lb.:

In.	3/16	¼	5/16	⅜	½
	15c	14c	12c	11c	10c
	⅝	¾	⅞	1	
	9½c	9c	8c	8c	

WEDGES.

Ax	per doz.	Nets
Galling	per lb.	Nets
Saw	per lb.	8½

WEANERS.

Calf.

Fuller's, per doz.	$2 00 to $ 2 50
Tyler's Safety, per doz.	1 85 to 2 40
Carroll's, per doz.	3 00 to 3 75
Hoosier, per doz.	3 50 to 4 60
Shaw Perfected	3 00 to 3 75

WEIGHTS.

Hitching ..... per lb. Nets

Sash—f. o. b. Chicago.

Ton lots, per ton	$40 00
Smaller lots, per ton	42 50

WHEEL BARROWS.

Common Wood Tray	$3 00
Steel Tray	4 50
Angle leg, garden	5 75

WHEELS.

Carborundum 50%

Emery 60%

Well, Ins.	8	10	12
Per doz.	$5 50	7 25	8 50

12-in. heavy hoisting, per doz. $25 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs.	$3 45
Galvanized barb wire, per 100 lbs.	4 15
Wire cloth — black painted, 12-mesh, per 100 sq. ft.	2 50
Cattle Wire—galvanized catch weight spool, per 100 lbs.	4 15
Galvanized Hog wire, 80 rod spool, per spool	3 85
Galvanized plain wire, No. 8, per 100 lbs.	4 00

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	6-inch		30%
" " "	8- "		30%
" " "	10- "		30%
" " "	12- "		30%
Coes Knife-Handle,	6- "		30%
" " "	8- "		30%
" " "	10- "		30%
" " "	12- "		30%

Coes All Patterns 30%
Bemis & Call's:
Adjustable S. 10%
Adjustable S Pipe, 10%; Briggs' pattern 30%
Combination Bright 25%
Steel Handle Nut 30%
Combination Black ..... 25&5%
Merrick Pattern 30%
Knife Handle Pattern.
No. 63, Screw Wrench, List plus 30%
No. 60, Steel Handle 30%

WRINGERS.

No. 790, Guarantee,	per doz.	$60 00
No. 770, Bicycle	"	55 00
No. 670, Domestic	"	51 00
No. 110, Brighton	"	45 00
No. 750, Guarantee	"	60 00
No. 740, Bicycle	"	55 00
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No. 2, Superb	"	30 00

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Thatcher Furnace Co., Chicago, Ill.

Heaters—Combination Hot Water.
Melbye Bros. Co., Chicago, Ill.

Heaters—School Room.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Hero Furnace Co., Sycamore, Ill.
Meyer Furnace Co., Peoria, Ill.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Standard Furnace & Supply Co., Omaha, Neb.

Heaters—Warm Air.
American Furnace Co., St. Louis, Mo.
Black Diamond Furnace Co., Monmouth, Ill.
Carr Supply Co., Chicago, Ill.
Cooperative Foundry Co., Rochester, New York
Excelsior Steel Furnace Co., Chicago, Ill.
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Fox Furnace Co., The, Elyria, Ohio
Germer Stove Co., Erie, Pa.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Hall-Neal Furnace Co., Indianapolis, Ind.
Heckler Bros., Pittsburgh, Pa.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hero Furnace Co., Sycamore, Ill.
Hess-Snyder Co., Massillon, Ohio
Independent Stove Co., Owosso, Mich.
Kruse Co., Indianapolis, Ind.
Kulp & Co., C. P., Chicago, Ill.
Lamneck Co., W. E., Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Magee Furnace Co., Boston, Mass.
Mahoning Fdy. Co., Youngstown, Ohio
Majestic Co., The, Huntington, Ind.
Manny Heating Supply Co., Chicago, Ill.
Meyer Furnace Co., Peoria, Ill.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Oakland Foundry Co., Belleville, Ill.
Peerless Foundry Co., Indianapolis, Ind.
Premier Warm Air Heater Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Scheible-Moncrief Heater Co., Cleveland, Ohio
Schill Heater Co., Cleveland, Ohio
Schill Bros. Co., Crestline, Ohio
Schwab & Sons Co., R. J., Milwaukee, Wis.
Standard Fdy. & Mfg. Co., De Kalb, Ill.
Standard Furnace & Supply Co., Omaha, Neb.
St. Louis Heating Co., St. Louis, Mo.
Taplin Furnace Co., Grand Rapids, Mich.
Thatcher Furnace Co., Chicago, Ill.
XXth Century Heat. & Vent. Co., Akron, Ohio
Utica Heater Co., Utica, N. Y.
Victor Heater Co., Marshalltown, Iowa
Waterloo Register Co., Waterloo, Iowa
Wise Furnace Co., Akron, Ohio

Horse Shoes.
American Steel & Wire Co., Chicago, Ill.

Humidifiers.
Haynes, Kansas City, Mo.

Indoor Closet.
Independent Reg. & Mfg. Co., Cleveland, Ohio

Jobbers—Hardware.
Bullard & Gormley Co., Chicago, Ill.
Clark-Smith Hardware Co., Peoria, Ill.

Kitchen Utensils.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Lath—Expanded Metal.
Milwaukee Corrugating Co., Milwaukee, Wis.

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Razor Blades.
Hyfield Mfg. Co., New York, N. Y.

Machines—Stove Pipe.
Hemp & Co., St. Louis, Mo.

Machines—Tinsmiths'.
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hemp & Co., St. Louis, Mo.
Knoedler, Frederick J., Philadelphia, Pa.
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Whitney Mfg. Co., W. A., Rockford, Ill.

Mailing Lists.
Ross-Gould, St. Louis, Mo.

Metals—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Miters.
Friedley-Voshardt Co., Chicago, Ill.

Nails—Slating.
Hussey & Co., C. G., Pittsburgh, Pa.

Nails—Wire.
American Steel & Wire Co., Chicago, Ill.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Patterns—Furnace and Stove.
Auer Register Co., Cleveland, Ohio
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Shaw & Son Co., The Geo. E., Cleveland, Ohio
Taft Metal Pattern & Mfg. Co., Cleveland, Ohio
Vedder Pattern Works, Troy, N. Y.

Pipe and Fittings—Furnace.
Carr Supply Co., Chicago, Ill.
Excelsior Steel Furnace Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck Co., W. E., Columbus, Ohio
Manny Heating Supply Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Michigan Safety Furnace Pipe Co., Detroit, Mich.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Standard Furnace & Supply Co., Omaha, Neb.

Pipe and Fittings—Stove.
Hemp & Co., St. Louis, Mo.
Meyer & Bro. Co., F., Peoria, Ill.
Sullivan-Geiger Co., Indianapolis, Ind.

Pipe—Conductor.
Berger Bros. Co., Philadelphia, Pa.
Burton Co., W. J. Detroit, Mich.
Clark-Smith Hdw. Co., Peoria, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Hussey & Co., C. G., Pittsburgh, Pa.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Polish—Metal and Stove.
Black Silk Stove Polish Co., Sterling, Ill.

Posts—Steel Fence.
American Steel & Wire Co., Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Punches—Combination Bench and Hand.
Parker Supply Co., New York, N. Y.

Punches—Hand.
Parker Supply Co., New York, N. Y.

Quadrants—Damper.
Parker Supply Co., New York, N. Y.

Ranges.
Thatcher Furnace Co., Chicago, Ill.

Ranges—Combination Gas & Coal.
Cooperative Fdy. Co., Rochester, N. Y.
Malleable Iron Range Co., Beaver Dam, Wis.
Quick Meal Stove Co., St. Louis, Mo.

Ranges—Gas.
Dangler Stove Co., Cleveland, O.
Germer Stove Co., Erie, Pa.
Quick Meal Stove Co., St. Louis, Mo.

Rasps.
Heller Bros., Newark, N. J.

Register Shields.
Hall-Neal Furnace Co., Indianapolis, Ind.

Registers—Warm Air.
Auer Register Co., Cleveland, Ohio
Carr Supply Co., Chicago, Ill.
Excelsior Steel Furnace Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Reg. & Mfg. Co., Cleveland, Ohio
Majestic Co., The, Huntington, Ind.
Manny Heating Supply Co., Chicago, Ill.
Marsh Lumber Co., Dover, Ohio
Rock Island Register Co., Rock Island, Ill.
Standard Furnace & Supply Co., Omaha, Neb.
Stearns Register Co., Detroit, Mich.
Tuttle & Bailey Mfg. Co., Chicago, Ill.
Walworth Run Fdy. Co., Cleveland, Ohio
Waterloo Register Co., Waterloo, Iowa

Please mention AMERICAN ARTISAN AND HARDWARE RECORD when writing to advertisers

The 1922 NEW IDEA Pipeless Furnace

Type "A"

NEW IDEA Type "A" Pipeless Furnace

One Man Sets It Up

Triple galvanized casings. Extreme simplicity. Casings "slip on" by patented device. Only a few screws to tighten. No nuts to bother with. A one man proposition.

Lower Prices

Prices low. Terms Liberal. Our attractive agency proposition allows NEW IDEA dealers to sell at a handsome profit.

Frameless Doors

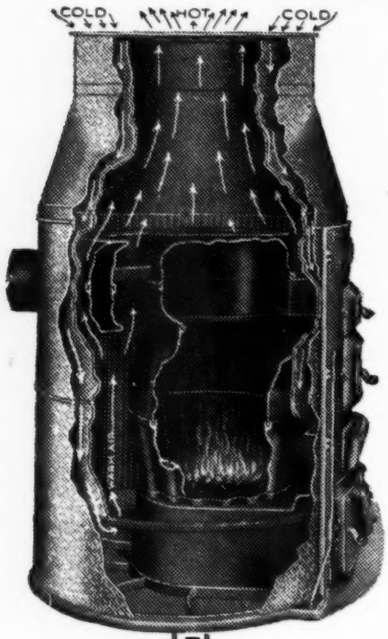
Feed Door and Ashpit Door are ground by special process to perfect fit. No frames. No joints. No cement.

Get Information at Once

The NEW IDEA agency is valuable. Some territories still open. Write for full particulars on the easiest selling furnace on the market.

UTICA HEATER COMPANY, UTICA, N. Y.

218-220 West Kinzie Street, Chicago, Illinois



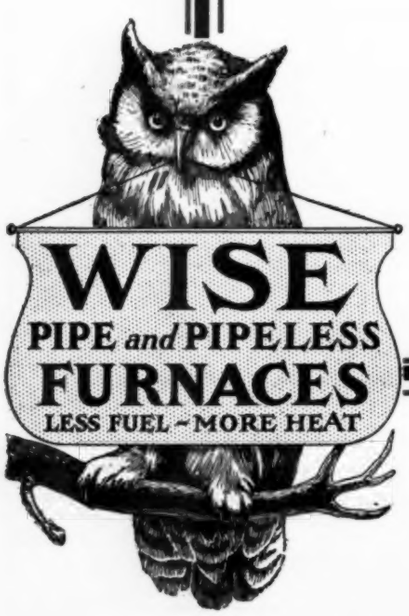
Find out Wise 1922 will make

NO matter what your prospective customer's heating requirements may be if you're a Wise dealer you will be able to fill them.

The line is complete—a size for every need—at a price that will appeal to wise buyers.

Write us today for catalogs and circulars which describe and illustrate the entire Wise line.

Ask us about the 1922 Wise agency. Let us show you exactly why you can be a prosperous and Wise Warm Air Heater dealer this coming year.



THE WISE
AKRON

now why dealers good profits

THOUSANDS of progressive warm air heater dealers have learned that it is good business to sell Wise Warm Air Heaters, pipe and pipeless, because they are good warm air heaters—heaters that have sound, practical features which actually do save fuel, labor and operating expense for the users.

These experienced installers continue to hold their Wise agencies year after year. They value the certainty of service and the exceptional heating capacity of Wise Warm Air Heaters—even when installed in the largest of homes.

FURNACE CO.

OHIO

SCHEIBLE

Warm Air Heaters

NOTICE from the illustration that the radiating surfaces of the Scheible Warm Air Heaters are laid out to provide for an easy, natural, unobstructed upward flow of warm air. The radiator construction provides a large interior air passage so that a large part of the air to be warmed passes between two heated surfaces before entering the warm air pipes at the top.

THIS scientific construction makes possible the production of healthful, pure, warm air. It insures economy in the use of full, positive circulation and quick heating.

For over thirty years good business builders for our dealers.

SCHEIBLE dealers secure good profits from their sales and real cooperation from us. That's why the Scheible agency is held year after year.

Built to give unusually good service and liberal profits.

OUR catalog illustrates and describes Scheible Warm Air Heaters in detail.

We will be glad to forward a copy to your address upon request.

Old-fashioned good quality, sound construction and time-tried features.

OUR large volume of sales and many years of experience enable us to quote attractive prices on a complete line of warm air heaters.

Write today for agency particulars—have us show you why Scheible Warm Air Heaters satisfy every user and dealer.

The Scheible agency for 1922 will be an asset for you.

Address your inquiry to

SCHEIBLE-MONCRIEF HEATER COMPANY

1444 West Ninth Street

Cleveland, Ohio

DEALERS!

The New WEIR Prices for 1922

and a complete line of selling helps

Are All Ready

Drop Us a Post Card for Complete Details

MEYER FURNACE COMPANY

PEORIA, ILLINOIS

Northwestern Distributors
Standard Furnace & Supply Co.
Omaha and Sioux City

Southwestern Distributors
Meyer Furnace & Supply Co.
Kansas City

Eastern Distributors
Demmler Bros. Co.
Pittsburgh, Pa.

EXCELSIOR SPECIAL
Warm Air Furnace

The Excelsior Special is a real warm air heater—notice the solid, heavy construction and the increased radiating surface. The furnace that gives more heat for less money. Excelsior dealers make easier and more profitable sales. A post card request brings full details.

EXCELSIOR
HEATING SPECIALTIES

We manufacture a complete line of high-quality reasonably-priced heating specialties.

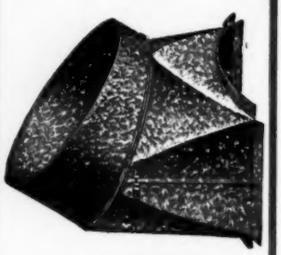
We always have large stocks on hand and can make quick shipments on all orders.

Write Now for New Catalogs
New Circulars and Prices

Look over some of our heating specialties shown on this page

THE EXCELSIOR STEEL FURNACE CO.

114-118 South Clinton Street
CHICAGO, ILLINOIS



Style C Shoe

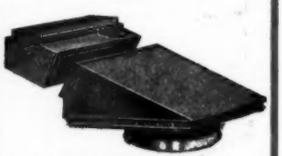
Excelsior Stove Pipe Elbows

Excelsior Self-Locking Double Wall Pipe

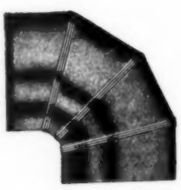
No. 209 Boot

Excelsior Steel Baseboard Register

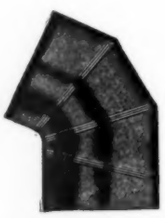
Self-Positioning Patented Stack Head



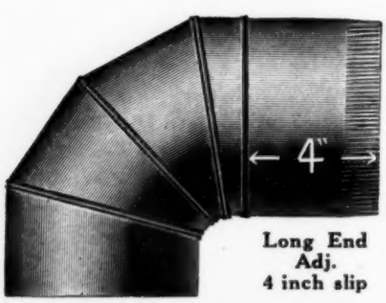
No. 52 Boot and 53 Offset



Adjustable Four-Piece 90° Elbows



Adjustable Four-Piece 90° Elbows

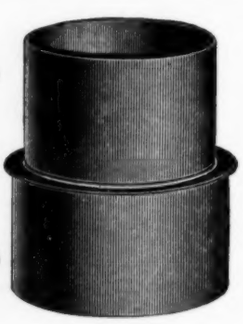


Long End Adj.
4 inch slip

EXCELSIOR STOVE PIPE ELBOWS

6-inch—Small End

7-inch—Large End



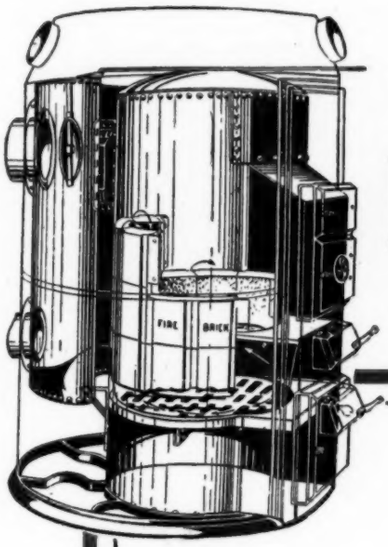
STYLE A

6-inch—Small End

7-inch—Large End Oval

STYLE F. (Pat. Nov. 1, '18)

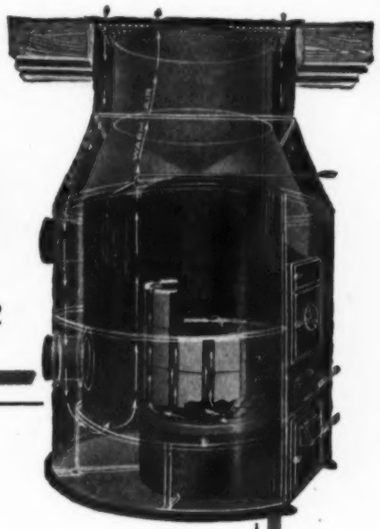
EXCELSIOR STOVE PIPE REDUCERS



The

PEERLESS

Line



Win sales with this quality group of Warm Air Heaters

PEERLESS superiority is dominant. The line is foremost because of distinctive features in each heater—features that allow you unusual opportunities to give your customers unmatchable value.

All Peerless heaters (except the all cast) are made of genuine Armco Ingot Iron. This iron does not crack, will not rust and it is durable and unbeatable for withstanding intense heat and pressure.

The seams of Peerless Armco Ingot Iron warm air heaters are riveted—making them absolutely gas and soot proof. The fire pots are built of high grade fire bricks.

We cannot tell you all about the Peerless Warm Air Heaters here—our catalogs explain and illustrate in detail.

The Peerless Agency plan for the coming year has made a big impression with our many new Peerless dealers. Let us tell you about this attractive co-operative selling arrangement now.

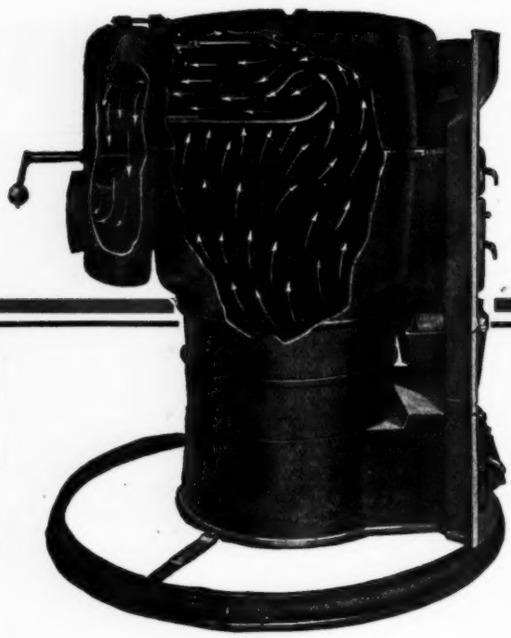
PEERLESS FOUNDRY COMPANY

Manufacturers of Warm Air Heaters, Duplex Registers, Peerless Coal Chutes and Furnace Fittings.

1853-1955 Ludlow Ave. Indianapolis, Indiana

Write today for illustrated catalogs

and find out more about how our Engineering Department prepares full details, plans and estimates for your installations of Peerless Warm Air Heaters.



At the left—
The New Floral City Furnace

At the right—
The Floral City Queen Pipeless

The completeness of the Floral City Line

enables you to sell and satisfy every prospect

OUR many years of successful warm air heater manufacturing experience makes it possible for us to keep before the public and the trade a most **complete** line of up-to-the-minute high grade warm air heaters.

You'll find in each of the different Floral City Furnaces many unusually distinct features of construction. The different constructions are designed to meet the various heating requirements of homes of all kinds. This is a big advantage to our dealers—it will prove a big selling help to you.

We call your special attention to the **New Floral City Furnace** illustrated above at the left. Its new and unusual features will interest you.

We cannot enumerate on this page the many exclusive selling and heating features of the Floral City Furnaces—our interesting illustrated circulars and catalogs cover the line in detail and we urge you to send for them **NOW.**

The Floral City Agency for 1922

We have an agency proposition that is attracting much attention and it will interest you. Our new prices on this superior line make the Floral City connection a real business stimulator.

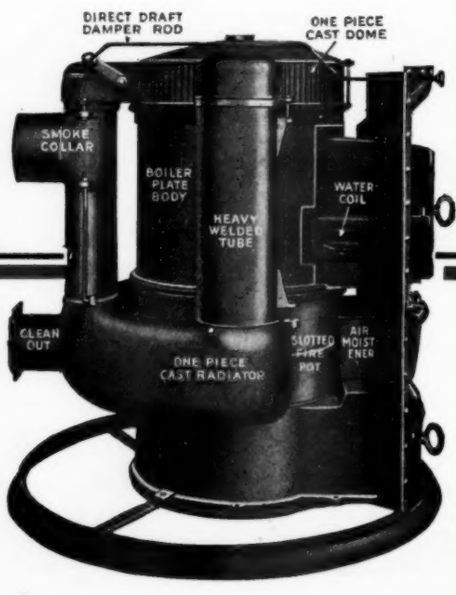
Let us tell you about it TODAY

THE MONROE FOUNDRY & FURNACE CO.

Makers of High Grade Furnaces for over forty years MONROE, MICHIGAN

At the left—
The Floral City Queen Furnace

At the right—
The Floral City King Furnace



Look Behind the Furnace— Into the Organization Itself!

THINK this over: When you sell a furnace to a home-owner you sell him an important part of his home—something he expects to last a lifetime. His comfort depends on its efficiency. He expects it to be economical on fuel. The furnace must be one that will keep him satisfied. It must build permanent good will for your business. That's why it is of utmost importance to look behind the furnace—into the organization, before choosing your furnace.

Back of Gilt Edge Furnaces is a record of 45 years standing—a record of continuous growth based on the quality of the product and our satisfactory relationship with dealers.

The success of Gilt Edge Furnaces over a large period of years guarantees your success in handling them. Our engineering department offers you a service which insures the right installation for every home. To handle Gilt Edge is to build a permanent furnace business, satisfactory from every viewpoint.

Write for the Gilt Edge Catalog and full information.

R. J. SCHWAB & SONS CO.
Dept. 00, 283 Clinton Street MILWAUKEE, WIS.

GILT EDGE FURNACES

Below is shown the difference between Gilt Edge and ordinary fire travel. In Gilt Edge the heated gases travel all the way around the radiator. No heat is wasted. In the ordinary furnaces the gases are divided, half traveling each way, wasting much of the heat.

Gilt Edge Fire Travel

Ordinary Fire Travel

AMERICAN BOILER PLATE

Warm Air Heater

BUILT LIKE
A
POWER BOILER

IF you are tired of losing sales on Cast Iron Warm Air Heaters because you *do* have to admit to prospective customers that the fire pot is liable to crack and that it is possible for soot and gas to leak through the joints — line up now with the thousands of other progressive warm air heater installers who are clinching sales with the American Boiler Plate Warm Air Heater.

Its riveted air tight construction of Boiler Plate insures to your customers clean, warm air, the firebrick lining against scorched air. Its all steel construction guarantees them against the possibility of having the heater crack.

Let our catalog tell you about its many other high class features—selling points which make it a big profit maker for our dealers.

Let us tell you about the selling assistance we give you.

Our method of cooperating with you to sell our entire line is practical. If you are interested in securing the agency for your district we can show you how to get the business.

Write TODAY, right now, for full details.

We also make
THERMO CAST IRON FURNACES
THERMO PIPELESS FURNACES
AND
AFCO ROOM HEATERS
Write Today For Complete Catalog

AMERICAN FURNACE CO.

2719 to 2731 Morgan St.
ST. LOUIS MISSOURI

A Better Furnace

The illustration shows some

MASTER FEATURES

ALL Cast Front. Two-piece fire pot, corrugated, and extra heavy. Large size feed door. Extra large ash pit and full size ash door.

Exceptionally *large cast radiator, oval shape —no corners for soot to lodge in.* Deep female cemented joints connecting all parts.

MASTER

Reg. U. S. Patent Office

WARM AIR FURNACE

QUALITY and heating efficiency are the big items in the MASTER. It is made from a high grade iron adapted to furnace work.

Notice the simple construction. This makes the MASTER a *time saver* when installing.

Durability is maintained throughout. The general lines of construction are arched, which insures against giving way and breaking down. The weight is properly distributed, the fire pots, dome and radiator being exceptionally heavy.

Make the New Year a MASTER Year

Sell the MASTER furnace—the warm air heater that will bring you more customers and give your customers more heating value.

It is easy to sell, easy to install and guaranteed to give satisfaction.

Prices are attractive.
Write today for detailed catalog.

Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Ill.

MASTER PIPELESS

Both inner and outer casings fasten to cast iron front, making a rigid fit. Triple inner casing (two sheets galvanized steel riveted together, the inner sheet corrugated, with a layer of asbestos between). Large and properly proportioned cold air space between the outer and inner casing. Heavy galvanized outside casing. Register box adjustable to any height.

52 Years of Leadership

For over half a century the Red Cross Line has satisfied customers and given our dealers substantial profits and good reputations

The Red Cross Empire Pipeless is in demand—Now

OUR dealers are having good sales with the Empire Pipeless Warm Air Heater NOW. That's because there's something decidedly different about the Red Cross Empire. It meets the requirements of particular people where other makes fail.

It always fulfills its purpose as a good investment—it is durably constructed—built to last a lifetime and designed to give efficient and economical heating service.

We make the Red Cross Empire Pipeless a quality product throughout and we use the same identical heater that is used in our famous Red Cross Empire *pipe* warm air heater.

Investigate our claims for The Red Cross Empire Pipeless

When you sell Red Cross Empire Warm Air Heaters you can guarantee your customers heating satisfaction—that's what they want and that's what you want to sell.

Red Cross Empire Warm Air Heaters—pipe and pipeless—dominate the field.

The line is complete—a heater for every requirement at a price that is always right.

Write today and have us explain our liberal agency proposition. Our latest catalogs and circulars illustrate and describe in detail our entire line of Red Cross Pipe and Pipeless Warm Air Heaters, Stoves and Ranges. Your request brings them at once.

CO-OPERATIVE FOUNDRY COMPANY

ROCHESTER, NEW YORK Western Branch—505 S. Clinton Street, Chicago, Illinois Pacific Coast Agency—SIMON BROS., San Francisco, Cal.

Manufacturers of the Celebrated Red Cross Stoves, Ranges and Furnaces

This

FRONT RANK

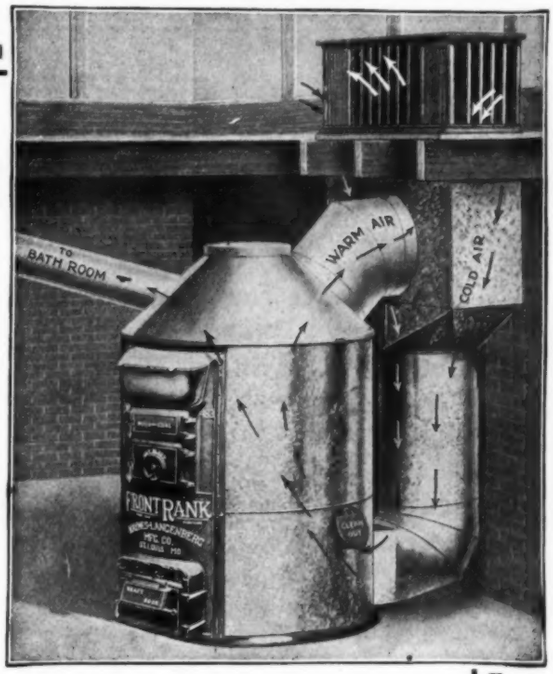
TRADE NAME REGISTERED

Combination

is a big seller for our dealers. It is a most efficient heater and its design also makes it an attractive addition to the home.

It is simple, easy to install and a satisfactory warm air heater in all respects.

You will find this Front Rank a money maker. It is not a cheap heater—the furnace is our famous steel cold riveted gas and soot proof heater.



Write now for full details on this Front Rank Combination Warm Air Heater. We will plan every installation for you if you desire—without charge.

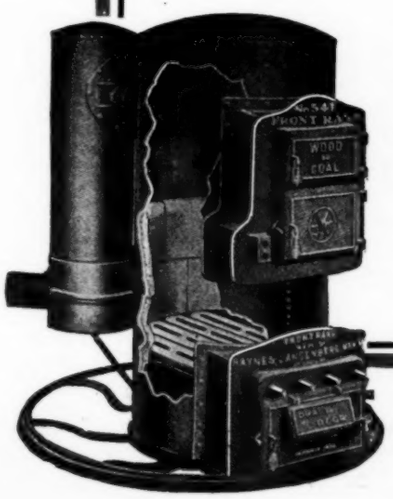
FRONT RANK

TRADE NAME REGISTERED

Warm Air Heaters

The public demanded more Front Rank Steel Warm Air Heaters last year than any preceding season. The Front Rank fame grows larger each year as more and more people learn of and recognize the value of these far superior features. Made of STEEL, heavy plates which are cold riveted together making all joints absolutely gas and soot proof.

Unlike many other furnaces Front Rank Steel Heaters won't crack or warp. They last a lifetime and withstand heat and pressure like a power boiler. They have radiating surfaces much larger than other furnaces and because of their superior construction they radiate heat quickly and are economical users of fuel.



WRITE NOW FOR COMPLETE AGENCY DETAILS

If there is no Front Rank agency for your district we can make you an attractive selling plan for 1922.

We give our dealers actual selling helps—we co-operate with you in every way to help you make sales.

We gladly plan every installation for you.

Write today for our new catalog

HAYNES-LANGENBERG MFG. CO.

4058 FOREST PARK BOULEVARD

ST. LOUIS, MISSOURI

Our sales increase each year—
Yours will, too, with this quality line

OUR sales can grow only as much as the sales of our dealers. And last year was our biggest year. Therefore XXth Century representatives realized more than ever before that the XXth Century agency is a real asset to their business. The high quality of the material used, the super construction, the unusually efficient design, the gas consuming features, the reliability of the heaters and the company that makes them—all these are just some of the reasons why

XXth CENTURY
Warm Air Heaters

make real profits for our dealers. One XXth Century Warm Air Heater usually sells at least one more for our dealers.

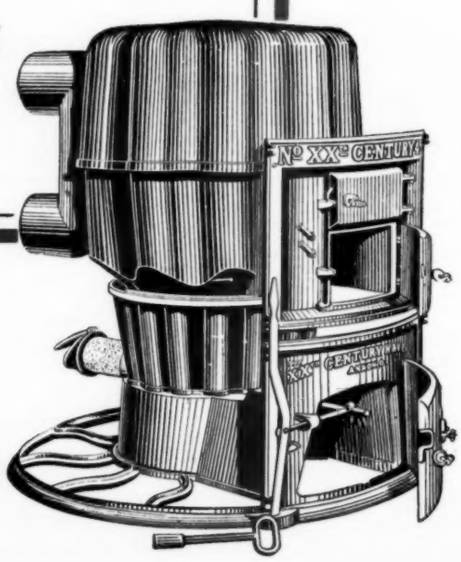
A customer must either boost or knock the heating plant he has installed in his home, and XXth Century users are boosters because they get from the XXth Century comfortable and economical heating service.

If your territory has no XXth Century representative you should get our agency proposition NOW.

We will be glad of the opportunity to prove to you that our agency is a steady, reliable money maker for dealers.

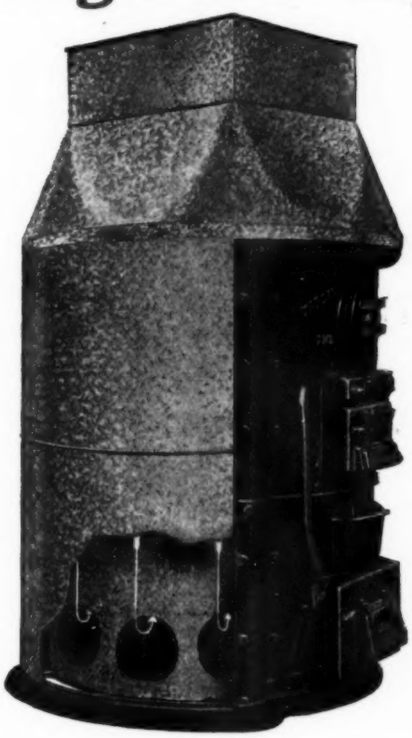
Write Today for Our Catalog

The XXth Century Heating & Ventilating Company
AKRON, OHIO



Make 1922 a
XXth CENTURY
Year

Agents and Jobbers Wanted



Yes--It Is Different!

Now look at its "insides"

THAT'S where the Taplin One Pipe Heater excels. We use the same well known Taplin Hot Blast Furnace as used in our regular pipe heater. For homes that can be heated with this type of heater we recommend the Taplin on many points of superior construction.

TAPLIN FURNACES are made in fourteen sizes and types to meet any requirements. We also manufacture the Valley City Furnace which combines great heating capacity with low price.

The Taplin line is full of features—write TODAY for our catalogs and circulars which describe and illustrate the line in detail.

Special Notice

LARGE distributors of Warm Air Heaters will be interested in the Taplin line. We have recently closed contracts for extensive exclusive territories.

WRITE TODAY!

For prices and our plan of financing the sale of this wonderful line of heaters. This plan has proven profitable to others, why not you?

TAPLIN FURNACE COMPANY

1701-1731 Clyde Park Ave. S.W., GRAND RAPIDS, MICHIGAN

TAPLIN HOT BLAST FURNACE

The Impression

PATENT APPLIED FOR

Made by Our Announcement of

The New Warm Home

(Sectional Casing)

Pipeless Furnace

can hardly be measured at this writing. Ever since the first announcement, made in American Artisan on December 3rd, we have been getting dozens and scores of inquiries asking for detailed information.

The invention of a pipeless furnace casing made up in sections—each section is a "tube" with a single outer and a double inner wall—so that when the several sections are stood on end they form a complete and tight fitting pipeless casing reaching from one side of the furnace front around to the other side, is the cause of many a man saying—

> "Well, what do you know about that—I wonder why that wasn't thought of long ago—guess I'll have to drop them a card and get all the dope on this thing, it looks like it is a great big step forward in pipeless furnace installations."

The sections form the cold air conduits and the space between the furnace proper and the inner wall is the warm air space—

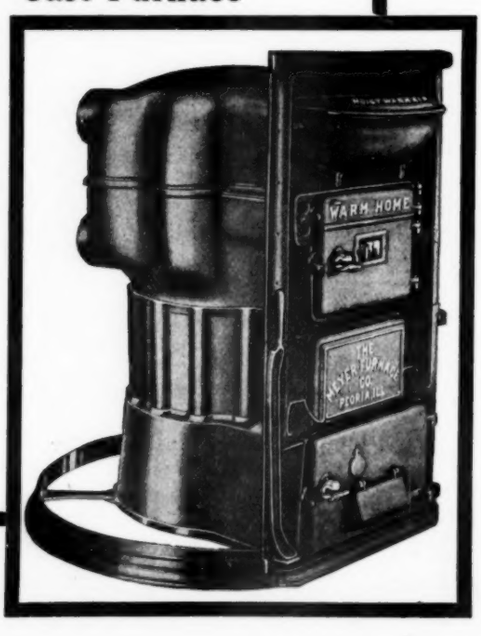
AND WHEN USED IN CONNECTION WITH

The New "Warm Home" Cast Furnace

the results are such as to delight both the dealer and the consumer. The dealer's profits are increased because installation costs are reduced to a minimum. This new sectional casing can be assembled in less that 20 minutes without tools.

Only 2 Casing Rings and 4 Bolts Used

Requests for local dealerships are coming in fast.



Meyer Furnace Company

Peoria, Illinois

"That Different Furnace"

The Only Furnace in America Made of Charcoal Iron

RUDY DIVING FLUE

Sold Under

Rudy Dealers Profit Sharing Plan (Copyrighted)

Manufactured by

THE RUDY FURNACE CO., DOWAGIAC, MICHIGAN

HERO FURNACES

A sturdy, dependable, thoroughly practical and therefore an easy selling line. There's a Hero Furnace to meet every requirement. They satisfy users and our dealers are offered practical selling and installation co-operation.

HERO PIPELESS FURNACE

The Hero Pipeless Furnace is an unusually good profit maker for Hero Dealers because of its extra sound construction and heating efficiency. If you want to sell a pipeless furnace that sells and satisfies, choose the Hero Pipeless.

OUR sales for the last three months of 1921 were greater than the sales of any other six months in the history of our company.

Hero sales are growing—Hero dealers are getting the business and the profits.

Our new large plant at Sycamore, Illinois, is one of the finest and best equipped in the country.

Let this big centralized organization serve you.

HERO FLOOR HEATER

HERO
FLOOR HEATERS

They make ideal heating plants for SCHOOLS, STORES and ROOMS without BASEMENTS.

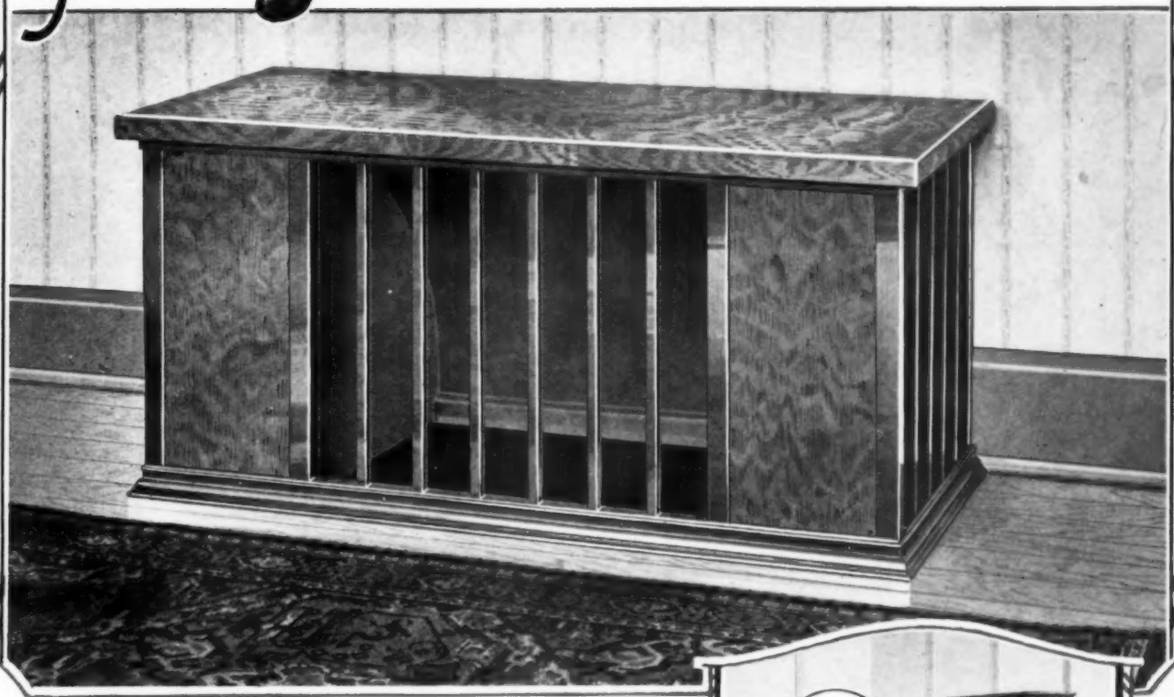
Now is a good time to secure the Hero Agency for your territory.

Write today for our illustrated catalog and agency plans.

Begin now to make 1922 a big year by selling the well established, well known and easy to sell Hero Line.

HERO FURNACE COMPANY
SYCAMORE, ILLINOIS

Majestic Duplex Register Unit



Widens Your Field For Sales and Profit

YOU owe it to yourself to investigate the MAJESTIC Duplex Register Unit and the sales possibilities it offers. Installed with any warm-air furnace, it assures better circulation and greater heating efficiency. And for smaller homes, where a single-register system is sufficient, it offers many OTHER new advantages.

You don't have to alter your furnace in any way to install the MAJESTIC Duplex Register Unit. The same casing as for pipe jobs are used—and your installations are simple and easy to make. Write today for descriptive literature and full information.

Nationally Advertised in The Saturday Evening Post

Endorsed and Supplied by These Furnace Manufacturers and Jobbers

FURNACE MANUFACTURERS

The Buck's Stove & Range Co., St. Louis, Mo.
Buck's Heating Plants
The Henry Furnace & Foundry Co., Cleveland, O.
Moncrief Furnaces
The Lennox Furnace Co., Marshalltown, Iowa.
Torrid Zone Steel Furnaces
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Front Rank Furnaces
Buffalo Co-Operative Stove Co., Buffalo, N. Y.
Amherst Furnaces.
The Wise Furnace Co., Akron, Ohio.
Wise Furnaces
The Mahoning Foundry Co., Youngstown, Ohio.
Mahoning Furnaces
Moore Bros. Company, Joliet, Illinois.
Moore Furnaces
The Black Diamond Furnace Co., Monmouth, Ill
Black Diamond Furnaces
The Meyer Furnace Co., Peoria, Illinois.
Wier Steel Furnaces
The Rudy Furnace Co., Dowagiac, Mich.
Rudy Furnaces
Monroe Foundry & Furnace Co., Monroe, Mich.
Floral City Furnaces
Art Stove Company, Detroit, Michigan.
Laurel Furnaces
Moncrief Furnace & Mfg. Co., Ltd., Guelph, Ont.
Moncrief Furnaces
Peninsular Stove Company, Detroit, Mich.
Peninsular Furnaces
Hart & Crouse, Utica, N. Y. & Chicago, Ill.
Royal Furnaces
Fuller & Warren Co., Troy, N. Y.
Stewart Furnaces
Galusha Stove Co., Rochester, N. Y.
Norman Furnaces
James Spear Stove & Htg. Co., Philadelphia, Pa.
Spear Furnaces
Graff Furnace Co., New York, N. Y.
Faultless Furnaces
Barstow Stove Co., Providence, R. I.
Barstow Furnaces
Hess Warming & Ventilating Co., Chicago, Ill.
Hess Furnaces
Premier Warm-Air Heater Co., Dowagiac, Mich.
Premier Furnaces
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Master Furnaces

FURNACE JOBBERS

Northwestern Furnace & Sup. Co., Minneapolis.
W. H. Williams Co., Baltimore, Md.
B. H. Quick & Son, Des Moines, Iowa.
The Standard Furnace & Supply Co. Omaha, Nebr.
Central Heating Supply Co., Chicago, Illinois.
The Dunning Htg. Supply Co., Milwaukee, Wis.
The Manny Htg. Supply Co., Chicago, Ill.
F. Meyer & Bro. Co., Peoria, Ill.
Tuttle & Bailey Mfg. Co., Chicago & New York.
The Columbus Htg. & Vent. Co., Columbus, O.
The Standard Furnace & Sup. Co., Sioux City, Ia.
A. P. Bartley, Oakland, Calif.
The Dahlen-Campbell Co., Spokane, Wash.

Manufactured by **THE MAJESTIC COMPANY, Huntington, Indiana**

The greatest improvement ever made in
WARM AIR HEATING

"It's some heater"

The PREMIER of Dowagiac.

Manufactured in the modern and up-to-date PREMIER Foundry which operated continuously throughout the year 1921.

The tremendous and continuous success of PREMIER sales proves that our policy of offering this unusual good quality is just what the dealer wants and needs.

The fact that so many of your fellow business men have found the PREMIER satisfactory and profitable is, perhaps, its strongest recommendation.

If you will examine this furnace as though you were buying one for your own home, you will want the agency.

That's why so many experienced dealers have taken on the PREMIER agency.

Isn't that the kind of a furnace you would like to sell?

PREMIER WARM AIR HEATER COMPANY

Manufacturers of
PIPE AND PIPELESS FURNACES
DOWAGIAC, MICHIGAN

PREMIER

IF YOU ARE A LIVE DEALER

you will get our exclusive agency proposition.

A Warm Air Furnace that will advertise itself by its performance represents the best co-operation that its manufacturer can give you.

An All Cast Iron furnace that will stand the test of time.

HECKLER

PIPE and PIPELESS FURNACE

Features—

Extra Large Ash Pit
Duplex Revolving Grate
Heavy Air Cell Fire Pot
Open Type Self-Cleaning Radiator
Deep Gas Proof Cup Joints
Large Feed Door

Write today for Catalogue and Prices

HECKLER BROS.

919 LIBERTY AVENUE
PITTSBURGH, PA.

BLACK DIAMOND
MOIST WARM AIR
FURNACE

Win in 1922 with the BLACK DIAMOND AGENCY

START the New Year right—join our hundreds of new live dealers who are enthusiastically selling this unusually superior warm air heater.

This may sound funny but it's true—our dealers are sending in re-orders in numbers far above our fondest expectations. Our Monmouth plant is running full capacity—business is good.

Now then, just to show you how good we and our dealers know the Black Diamond is, we will ship to dealers of approved credit a Black Diamond furnace for inspection, and if you don't find it the best furnace on the market to handle for the coming year, we will take it off your hands and stand all shipping expense.

We can make this liberal proposition because we know that you, like hundreds of other dealers, will find the Black Diamond a dependable, easy selling, satisfaction-giving and profit making furnace.

We call a Spade a Spade— and a Black Diamond a Black Diamond See our cards before you play—Write today let us deal you a hand—

Write today for full details concerning agency and construction—

Drop us a post card and let us send you catalog and circulars which describe and illustrate the Black Diamond in detail. Let us show you what the Black Diamond agency is doing for our dealers and what it can do for you in 1922.

We can't begin to describe the Black Diamond in this advertisement and to mention just a few of its quality features is not fair—so write NOW—make us show you why Black Diamonds can win for you.

THE BLACK DIAMOND FURNACE CO.
MONMOUTH, ILLINOIS

Z-RO KING FURNACES Mean Simplicity

THEY - ARE - EASILY - MOUNTED

The weight is properly proportioned

They are made in seven sizes

Four different series in Pipe Furnaces
Five different series in Pipeless Furnaces

SHOWING A FEW PIPELESS SERIES

Our Attractive Prices Will Boost Your Sales

ASK US FOR THEM

OAKLAND FOUNDRY CO., Inc.
BELLEVILLE, ILL.

Manufacturers of

"Z-RO KING"

WARM AIR HEATERS

ASK yourself this question: "What do my customers demand of the heater I sell them?"

Then see how well the "Home Comfort" meets these demands.

They want results--Comfortable Heating

MECHANICAL construction in general means little to your prospective warm air heater buyers. Comfortable, economical ***heating construction*** *is the topic that deeply concerns them.*

That's where the "Home Comfort" features become valuable to you.

Your prospects can understand that ***steel*** *won't crack—they can see that boiler-riveted joints can't leak soot into the rooms and that a large radiating surface gives them greater volume of warmed air.*

That's why "Home Comfort" Warm Air Heaters have been giving comfortable heating service to thousands of users for many years.

Our dealers have many other selling advantages other than those briefly outlined above.

Our latest catalog together with our 1922 Dealer Sales Plan will interest you.

We will gladly send them on request—write today.

Write us today and let us explain in detail the Comfortable Heating features of the "Home Comfort."

ST. LOUIS HEATING COMPANY
2400-06 Coleman St. ST. LOUIS, MO.

"HOME COMFORT"

CARR'S LINE

For 1922

Is the Winning Line-up

WE handle the most complete line of high grade Warm Air Heating Supplies in the Middle West.

Our **INTER-STATE** line Warm Air Heaters are made of the best materials and are strong and heavy. They are correctly designed and have all the latest practical features which make them high class, efficient warm air heaters.

Get our prices and circulars on these fast selling Furnaces

Carr Supply Co. Service is real service—we can supply you with anything you need for a warm air heating job.

We are headquarters for

FURNACES--REGISTERS
TIN and GALVANIZED FITTINGS
GRILLES—FACES
and
ALL WARM AIR HEATING SUPPLIES

AUER REGISTERS are highly efficient and economical. Besides being highest grade in all respects they are noted especially for their ease of operation and large capacity.

Let us show you some real furnace pipe in our Acme Fittings. You'll find them economical and easy to put up. Try some on your next job and notice their quality.

The Acme Damper Clip is made by us and it is the only damper clip manufactured that makes a damper with a backbone. It makes a damper a minute—rod and all and fits all sizes of dampers.

It is simple, strong and efficient. It holds the damper rigid.

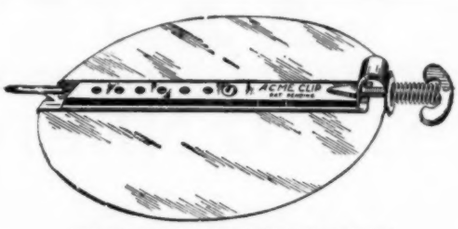
The Acme Damper Clip is the best thing you've ever seen—it makes a high grade damper at a low cost. Write for prices and a sample clip FREE.

"If you want Better Service let Carr supply you."

We've got a brand new catalog—let us send you one NOW—it lists our complete line for 1922.

CARR SUPPLY COMPANY

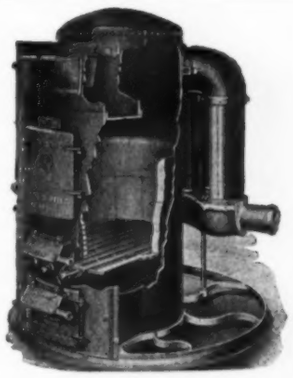
412-414 N. Dearborn St. **Chicago, Ill.**



THE ACME DAMPER CLIP

You Get—

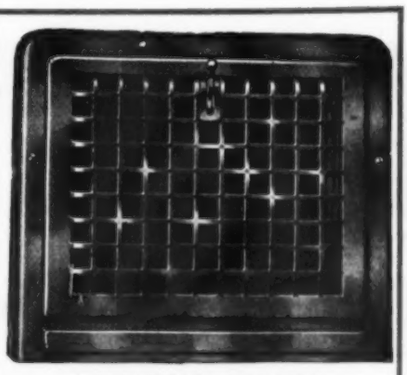
A Damper Clip
A Tail Piece
A Strong Stiffening Bar making a high grade damper and no labor or rivets required.



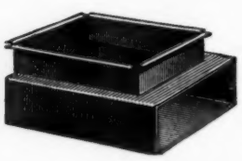
INTER-STATE STEEL FURNACE

INTER-STATE 20 SERIES

INTER-STATE 200 SERIES



AUER ECONOMY SIDE WALL REGISTER



"Everything I want when I want it—

There are 32 different styles, sizes and kinds of Moncrief Furnaces—Pipe, Pipeless, Three Pipe and Majestic-Moncrief. I couldn't expect to carry a stock of all of them, although I am likely to have a call for any one most any time.

With the splendid service the Henry Furnace people give me I only have to stock staple sizes of standard pipe furnaces and can depend on them to make prompt shipment of anything out of the ordinary.

About pipe and fittings, I depend on Moncrief altogether **now** because I can quickly get anything I want when I want it.

Moncrief Service will deliver you any Warm Air Heating need when you want it. Write, phone, call, or wire.

The Henry Furnace & Foundry Co. Cleveland, Ohio

Moncrief Pipe and Fittings,—and extensive line covering everything you need for a warm air heating job,—a practical line for practical men. First class materials and good workmanship assure you of prime quality in every item. Our new factory enables us to carry stocks for prompt shipment.

The Moncrief Furnace lends itself especially well to use with the Majestic Register, which is coming so largely into favor. Moncrief design results in a furnace whose parts are so well balanced as to adequately heat the large volume of air that the Majestic Register provides for.

MONCRIEF

PIPE, PIPELESS, THREE PIPE AND MAJESTIC MONCRIEF

FOR ALL WARM AIR HEATING NEEDS

Built up to our well known high standard of quality

MAGEE ONE-PIPE

All Cast Warm Air Heater

IF you are thinking of changing your line for 1922—investigate this unusually superior One-Pipe heater and you will find out why our dealers are holding the Magee agency for the coming year.

The MAGEE ONE-PIPE has appealed to hundreds of practical furnace men as a most reliable, efficient heater planned on sane lines but with many outstanding features.

The same high grade construction that has made the name MAGEE famous for many years is incorporated in the MAGEE ONE-PIPE.

Quality not sacrificed yet price is low

Study the illustration — some of the MAGEE features can be seen—then let us send you our catalog and circulars which give you full details on the MAGEE ONE-PIPE and our regular line of pipe heaters.

A post card request brings full information regarding the MAGEE Agency for 1922.

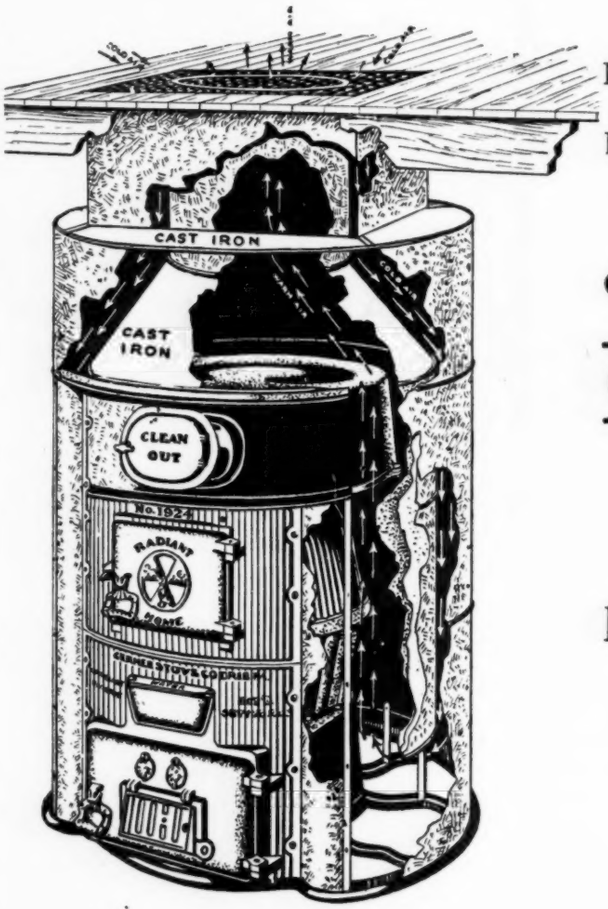
Do it NOW before you forget.

MAGEE FURNACE CO. Inc.
38 Union Street, BOSTON, MASS
Western Representative: **ROBERT P. BURTON**
30 West Lake Street, Chicago, Ill.

Will Burn Any Kind of Fuel

RADIANT-HOME FURNACES

NEW ALL CAST SINGLE REGISTER PIPELESS FURNACE



Made in Two Styles

INSIDE AND OUTSIDE CASING TOPS CAST IRON

EXTRA LARGE SIZE PORCELAIN IRON REGISTER

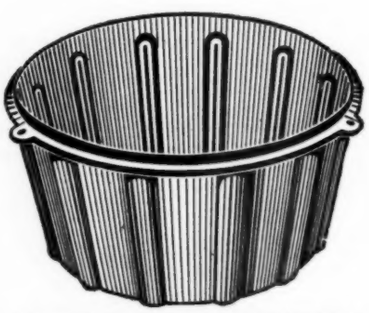
Furnace Put Up in Only Five Packages for Shipment—Most Compact

OCCUPIES LESS CUBIC FEET of SPACE

Guaranteed the Best

CELEBRATED PATENTED
RADIANT-HOME AIR BLAST FIRE POT

Produces 17% More Heat Units Than Any Other Type of Air Blast Fire Pot on the Market



COMPLETE COMBUSTION WITH ALL FUELS

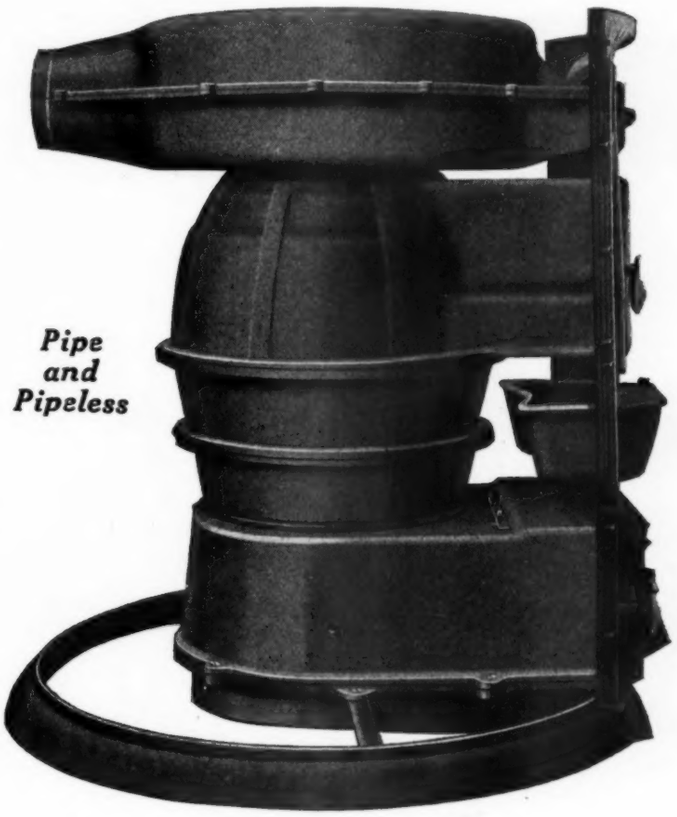
EASY TO INSTALL

GUARANTEED
TO EXCEL ALL OTHERS

GERMER STOVE COMPANY

LARGEST MANUFACTURERS OF
STRICTLY HIGH GRADE STOVES, RANGES AND FURNACES

ERIE, PA. **364 River St., CHICAGO, ILL.**



Pipe and Pipeless

A Superheater That Sells and Satisfies

Practical in Design and Sound in Construction

MANY years of experience in manufacturing Warm Air Heaters gives us the ability to design and build a warm air furnace that contains those practical features of construction which we know are necessary for the correct and comfortable heating of homes.

The Titan Superheater is made of the highest grade iron —it is heavy—properly fitted and its quality is first class throughout.

You—as an experienced warm air heating contractor—will readily recognize the superiority of the Titan Superheater.

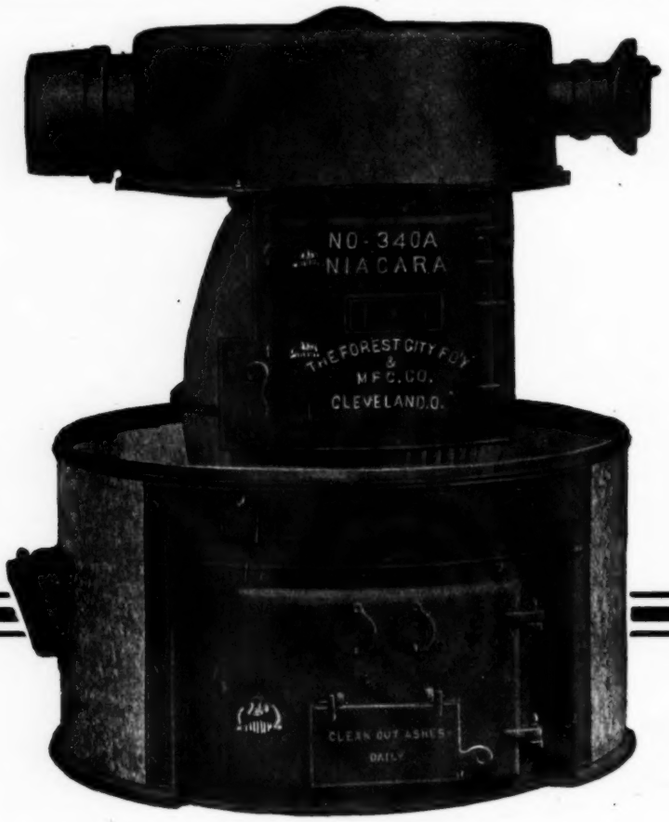
We invite your examination of its numerous points of merit which are set forth in detail in our illustrated catalog.

Write for this descriptive matter now and let us show you why a Titan superheater agency is a money maker for 1922.

STANDARD FOUNDRY & MFG. COMPANY
DE KALB, ILLINOIS

North Western Distributors: Nye Stove & Furnace Co., 414 Boston Blg., Minneapolis, Minn.

TITAN *SUPERHEATER* FURNACE



An Exceptional Heater—

Durable
Efficient
Economical

ANY warm air furnace must contain four distinct features, viz., quality, durability, efficiency and economy.

The **NIAGARA FURNACE** embraces all these features, is of medium price, and made in six sizes to heat all kinds and sizes of homes. They are made entirely of clean, high-grade pig iron especially adapted to the manufacture of heating apparatus, to expand and contract without warping or cracking.

They have extra large double doors to accommodate any kind of fuel, and triangular grates giving three service sides.

Our catalog describes this furnace fully. Write at once for prices and discounts for 1922 agency.

The Forest City Foundry & Manufacturing Co.
1220 Main Ave. Cleveland, Ohio

NIAGARA

Warm Air Heaters

The RENOWN comes Both PIPE & PIPELESS in a Size for Every Need

RENOWN
SMOKE-CONSUMING FURNACE

RENOWN
WHEN BURNING SOFT COAL BE SURE TO POKE BACK THE LIVE COALS AS FAR AS POSSIBLE BEFORE FEEDING FRESH FUEL
KEEP THIS WATER PAN FILLED
SHAKER DOOR
DRAFT DOOR

Invest in the Best

YOUR profits and prestige are both at stake when you sell a heating plant to your valued customer. You cannot afford to recommend or install an inferior plant. You must, in short, be sure to *invest in the best.*

A simple examination of the original and exclusive worthwhile RENOWN features shown below will convince you that the RENOWN cannot help being one of the best, most satisfactory heating plants you have ever handled.

Write to 1001 Bradley Street for our liberal proposition—Invest In The Best.

Automatic Fool-Proof Heat Regulator—Saves Fuel
Operated by a horizontal bar which is rigidly secured at its left end. Regular equipment on every RENOWN.

The Large Radiator is Self Cleaning
¼" space at bottom all around permits fine ashes and soot to sift back into fire pot.

The Large Combustion Chamber Gives Tremendous Heating Power
Permits complete combustion of smoke and gas. A very large radiating area.

The Famous Leak-Proof Cup Joints Used Throughout
Sealing the furnace absolutely air tight, and insuring that it will remain so indefinitely.

Extra Heavy Two-Piece Fire Pot
No chance of cracking. The proportions are unusually large. Burns hard or soft coal, coke and wood.

Large Air Passages Between Casings
Permit large volumes of cold air to circulate freely, and heat quickly.

Large Square Ash Pit
Keeps draught clear and ashes away from grate. Depressed, watertight bottom, permits sprinkling.

The Extra Large Register and Air Passages
Remove cold air quickly from the floors, assuring in return a very large volume of warm, moist air.

Heat Passes Completely Around Radiator
Giving a very long travel. All heat is therefore extracted from the burning gases.

The Hot Blast Inlet
A great fuel saver. Opens automatically when feed door closes. Remains closed with wood, coke or hard coal.

The Oval Fire Pot Burns Up the Smoke and Gas
Permits hot coals to be pushed back, and fresh fuel fed in front. The naked flames consume the smoke, reducing soft coal fuel bills one-quarter to one-third.

The Big Water Pan
Conveniently placed in front where it cannot escape attention.

Draft and Shaker Doors
All doors ground air tight, hung on large hinges, and will stay tight.

Double Shaker Bar Grate
Provided with 2 shaker bars. Back half of fire (the hot coals) may be cleaned independently of front half (the fresh fuel).

HEATING & COOKING **STOVES** RENOWN PIPE & PIPELESS **FURNACES**

INDEPENDENT STOVE CO. OWOSSO, MICH., U.S.A.

D MEYER Pres GEO MEYER, Vice Pres GEO HARMS, Sec'y & Treas

CAPITAL AND SURPLUS $300,000 00

THE MEYER FURNACE COMPANY

MANUFACTURERS OF THE

WEIR ALL STEEL GAS AND SOOT CONSUMING FURNACE
WARM HOME CAST FURNACE

PEORIA, ILL

December Sixteenth,
Nineteen Twenty-one

The American Artisan & Hardware Record,
620 South Michigan Boulevard,
Chicago, Illinois.

Gentlemen: (Attention E. Cohn, Manager)

Our business for 1922 is already assuming such proportions that it is our desire to have all matters pertaining to sales for the year arranged as soon as possible, and we would therefore appreciate your sending us a contract for our 1922 advertising space in your publication, as soon as possible.

If a little truth will do no harm, we might add that your publication seems to reach the highest class of real, live warm air furnace dealers and installers, and it is interesting to note the great care taken in fully covering the real news of the heating world. We are more than pleased with your service and co-operation and with the results obtained from the use of advertising space in the American Artisan.

We have had a comparatively nice business in 1921 and we are now looking forward to a very good business in 1922.

With high regard and best wishes, we remain

Yours very truly,

THE MEYER FURNACE COMPANY

R. C. Walker

HCW:M* Gen'l Manager

STEEL

"BUILT FOR SERVICE"

Mechanical Construction Same Whether Pipe or Pipeless

THE Lennox TORRID ZONE All Steel Furnace is the surest, shortest means to the success of an honest, enterprising dealer whose policy is to build up trade by virtue of definite satisfaction to his customers.

The Lennox TORRID ZONE Furnace is designed and constructed to successfully fulfil the requirements of the most critical furnace buyer.

It is economical, long-lived, easy to operate and provides a large volume of fresh, moist, warm air, free from gas and smoke, for every room in the house.

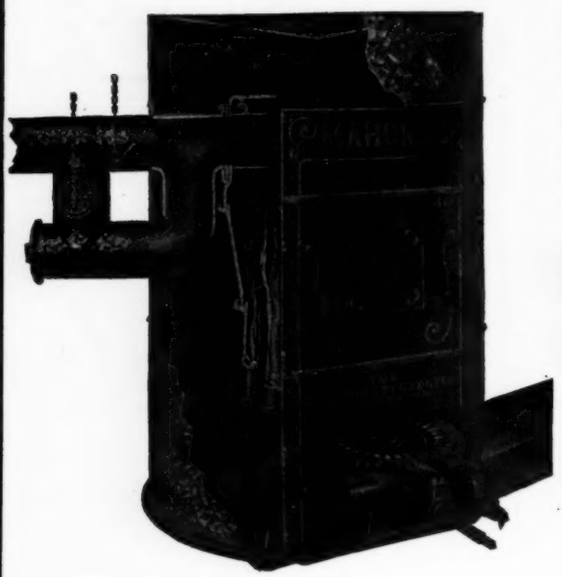
Write us for information concerning our agency for your territory.

LENNOX TORRID ZONE FURNACES

THE LENNOX FURNACE CO.
200 Lincoln Highway, Marshalltown, Ia.

APPROVED BY NATIONAL WARM AIR HEATING & VENTILATING ASSOCIATION
FRESH AIR HEAT MEANS HEALTH

THE JOB OF HEATING AN ENTIRE CITY



MAC DONALD, OHIO, in the heart of the steel industry, ordered 204 Mahoning (pipe) furnaces,—Newton Falls, Ohio, required 150 Wright (pipe) furnaces—Elwood City, Pa., took 200 Mahonings (pipe) and wanted more—Beach Bottom, W. Va., installed 125 Wrights (pipeless)—Harmersville, Pa., used 176 Wrights (pipeless). Farrell, Pa., and Midland, Pa., each ordered 100 Mahonings in pipe and pipeless.

MAHONING and WRIGHT FURNACES IN TWO TYPES

Mahoning and Wright furnaces are built in pipe and pipeless types. The fact that the heaters are foremost in great housing projects is significant to dealers who want to represent a guaranteed line that makes good on performance.

Write today for complete agency details, literature and price list

THE MAHONING FOUNDRY CO.

622 POLAND AVE. **YOUNGSTOWN, OHIO**

THEY PAY DIVIDENDS

NESBIT cast iron WEIR steel FURNACES

Dividends to the dealer because of satisfied customers.
Dividends to the user because tons of fuel are saved yearly.

WHY WAIT WEEKS FOR SHIPMENTS

when we can give you service unexcelled from either of our houses? We carry at all times a complete stock of everything that goes into a furnace installation.

Handy Pipe and Fittings
Rock Island and H & C Registers
Majestic Duplex Registers and Coal Chutes
Smoke Pipe, Elbows, Wood Faces, Asbestos Paper, etc.
also Peerless Gravity Single Register Furnaces

We Carry the Stock and Ship When You Want It

STANDARD FURNACE & SUPPLY CO.

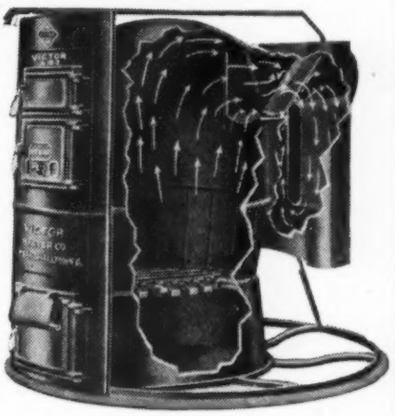
407-413 So. 10th St. **Omaha, Nebrask a**
411 Pearl St. **Sioux City, Iow a**

MARSHALLTOWN STEEL FURNACE
made for both pipe and pipeless setting

Marshalltown Steel *and* Victor Cast Furnaces

are made for the dealer or user who is looking for high grade goods.

They have the longest smoke travel, more radiating surface and fewer packed joints than any other furnace.



VICTOR CAST FURNACE
The furnace of few joints

The radiator at the back of both heaters is of a three flue construction doubling the efficiency of our radiator over all others of similar shape.

The quality of our goods places them in a class by themselves.

Write for prices now

VICTOR HEATER COMPANY, MARSHALLTOWN, IOWA

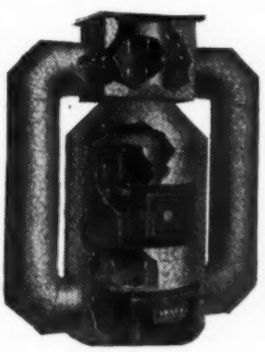
Notice the construction of the radiator and combustion chamber.

This feature means more radiating surface and full heating value from all fuel burned.

BOOMER

furnaces have been successfully made and sold for over 36 years. They have other good features that help dealers make sales. BOOMER DEALERS get real cooperation from us. *Write today for our latest catalog and let us tell you all about it.*

THE HESS-SNYDER COMPANY
MASSILLON, OHIO



A Real Heater

WRITE us today and we will tell you all about the many features which make this heater a real heater to handle. A quality furnace at a ***pre-war price.***

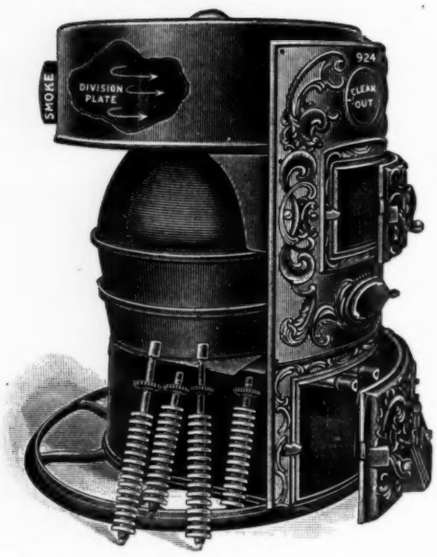
Our line of pipe and pipeless furnaces makes satisfied owners and brings big profits to the Dealer.

Our agency for your territory will bring ***you*** the profits.

Catalogue and full details upon request

SCHILL HEATER CO.
3205 Broadview Rd. CLEVELAND, OHIO

The KULP PIPELESS FURNACE



CAST IRON PIPE AND PIPELESS FURNACES

ORDER FROM THIS AD

PIPELESS FURNACES—COMPLETE:

20 in. Firepot	$ 82.00
22 in. Firepot	$ 88.00
24 in. Firepot	$110.00
26 in. Firepot	$123.50

PIPE FURNACES—LESS CASINGS:

20 in. Firepot	$55.62
22 in. Firepot	$60.86
24 in. Firepot	$72.56
26 in. Firepot	$84.89

Agents Wanted for Open Territories

A sample will be sent for your inspection if satisfactory references are furnished with order.

C. P. KULP & COMPANY

1607 South State Street
CHICAGO, ILL.

Extra Heavy

Piped or Pipeless

A line that sells—NOW

MANNY FURNACES

THESE heaters are high grade, efficient and have all the latest improvements. They are made of new high grade iron and are guaranteed. They are particularly noted for their superior clean cut construction. Get our prices and let us show you the quality of Manny Furnaces NOW.

We can supply you with EVERYTHING you need for a warm air heating job

FURNACES
REGISTERS
FITTINGS
WOOD FACES
SMOKE PIPE
DAMPER CLIPS
ASBESTOS-PAPER-PASTE-CEMENT
FURNACE CHAIN
"HANDY" PIPE

Low Prices — Prompt Shipments

We have built up our business by giving good service — the kind of service you want.

We carry complete Chicago stocks of the best lines and we can fill and ship your orders at once.

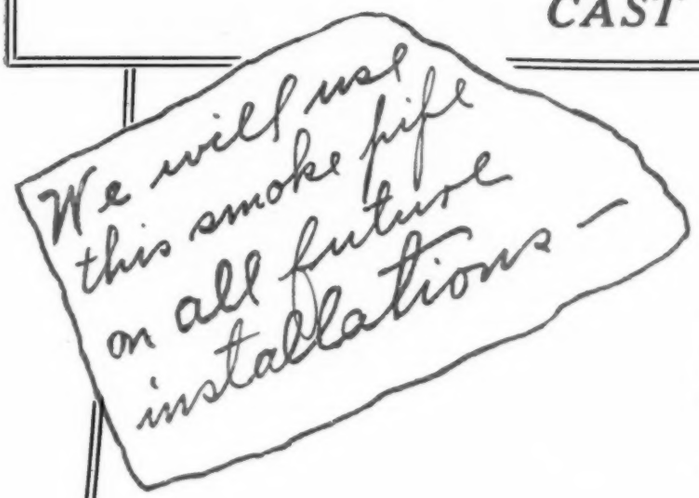
Let Manny quote you prices on supplies for your next job.

Write now for Catalogue and Discount Sheet

THE MANNY HEATING SUPPLY CO.
131 W. Lake St. Chicago, Ill.

Trade Mark Reg. U. S. Pat. Off.

KNOX
EVERLASTING
CAST IRON SMOKE PIPE



THAT'S what thousands of installers tell us when sending in their repeat orders for this special smoke pipe.

We believe you will say the same thing once you use it.

And here are the Reasons Why

First of all it's real smoke pipe—cast iron—as it should be. It won't burn out, fall down, scale, crumble or corrode. It outlasts the furnace and is easy to install. This pipe is the only smoke pipe not affected by rust or corrosion—it is the only smoke pipe that will give your customers permanent satisfaction—it is the only smoke pipe that does away with those yearly, troublesome and profitless sheet metal smoke pipe replacement jobs.

Knox Everlasting Cast Iron Smoke Pipe is used by thousands of the best installers in the country. They find that it gives them a better profit — that is why they use it on all installations—that is why you will want to use it.

A trial order will convince you. Try some on your next job

Knox Everlasting Cast Iron Smoke Pipe is the most practical warm air heating specially ever offered you. If you are desirous of improving your installations and at the same time securing satisfaction and profit from your work—start using this smoke pipe NOW.

Knox Everlasting Cast Iron Smoke Pipe comes in sections of varying lengths with elbows from 22½ to 90 degrees so that it will fit into almost any space. It nests closely for shipping making a saving in freight and store room.

Descriptive circulars and prices sent on request.

Jobbers who can fill your orders promptly:

Manny Heating Supply Co.,
131 W. Lake St., Chicago

Omaha Stove Repair Works,
Omaha, Nebraska

Wm. Warnock Company
Sioux City, Iowa

Lincoln Stove Repair Works
Lincoln, Nebraska

Leighton Supply Co.,
Fort Dodge, Iowa

Field & Shorb Co.,
Decatur, Illinois

Smith-Gray Heater Co.,
Muskegon, Michigan

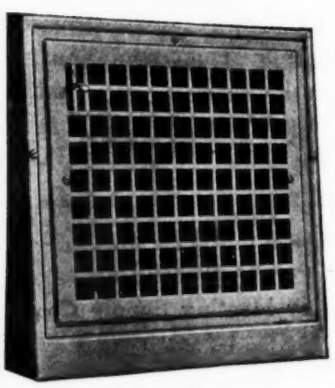
WATERLOO REGISTER COMPANY

WATERLOO, IOWA [INDIANAPOLIS, INDIANA—706 City Trust Bldg.

Four Beaters You Can't Beat

WHEN I was a lad, and wanted to go swimming the same afternoon Maw wanted me to beat the rugs; I never started in to beat them unless I had something to beat them with. If I had, I'd been beat before I started.

To my notion, now I am grown up, and wear long pants, the only way to beat competition is to have something that beats it.

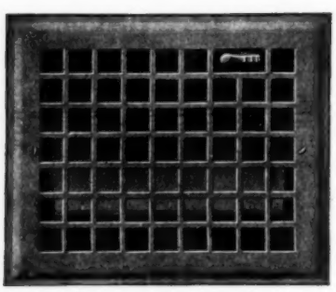


STYLE 900

(Plain Lattice—All Steel)
Baseboard Register

Here's a Happiness maker. It makes the women folks wear a perpetual look like Sunny Jim's sister. It's the one Baseboard register that won't streak the walls. It's a preventative—not a cure. It's tight as a drum. It's made so you can turn the flange of box underneath the face.

Deflector made in one piece with box-built edges, which keeps it from warping and insures close shutting.



STYLE 40

(Plain Lattice—All Steel)
"As Thin as a Wafer"

When you pick one up and give it the once over, it puts up such an all-fired strong argument that you simply say "this is what I call a real register."

Then when you find out that two simple little screws make it reversible, so you can use it either horizontally or vertically, you promptly break forth in song. At once you see that here's one register that's as good as two. So you promptly send your order for a goodly supply.

You can't beat competition, unless you have something to beat it with. The moral of which is: look at the line up below and send in your order. Can't tell what I'll talk about next time I come around. When I come, I'll tell you.

Yours 'till death,

Jer Bee

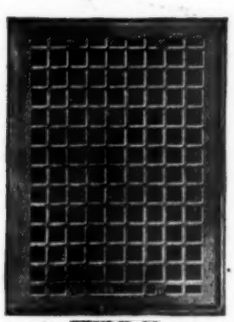
P. S. — Send for our new catalog Number 76.

TUTTLE & BAILEY MFG CO.

Boston
36 Portland St.

2 West 45th St.
New York

Chicago
1123-29 W. 37th St.



STYLE 70

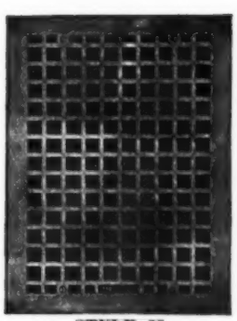
(Plain Lattice—All Steel)

Here is a register that will save you money in two ways. Being lighter it saves metal. Likewise, freight costs.

To overcome warping, the face is strongly braced with strengthening bars.

The bottom is exactly the same as we put on the Ferrosteel and operates with a roller movement, and is self locking. Bottom beveled, simplifying setting.

The edges of the face are offset to make a close fit against floor or wall. Made in plain lattice design only.



STYLE 60

(Plain Lattice—Ferrosteel)

A Ferrosteel register is just another name for iron and steel. When you look it in the face it's cast iron. When you look at its body, it's steel. It's a combination having the strength of cast iron, and lightness and unbreakableness of steel. Has a beveled body, making setting in tin box no job at all.

Just remember that beveled feature. Roller operator is self-locking.

A Better Register

It has always been our ambition to manufacture registers that would give perfect results to the ultimate user and to this end we have spent considerable time and effort, and at last we believe that our efforts have been rewarded and that we have solved the problem. We therefore place before you for your judgment and opinion

This New Stearns Register

The weak point of most registers is the tension spring upon which the opening and closing device depends. Springs for tension are BOUND to go wrong for this reason—Continual change of temperature from hot to cold and vice versa gradually but SURELY takes the life or "Spring" from the spring itself and the result is a register that will not work. We have positively proved this by conducting a test using all types of register springs. True, we found that some held up longer than others, but in the end the result was the same, a Spring that had no Tension.

No Spring in This New Register

A little study of the illustration of this register will show you that we have, namely, a CAM LOCKING AND RACHET OPENING LEVER which, when opened, stays OPEN, and when locked is ABSOLUTELY TIGHT AND LEAK PROOF.

There is positively NOTHING on this new register to wear out, become weak or will the user experience any of the other various troubles connected with the ordinary makes of registers. This device is protected by Patent Application and is absolutely warranted to last a life-time.

Let Us Send You a Sample—Now—Free

This superior register does not cost any more than the ordinary kind and to show our absolute faith in it we are prepared to send to you at no cost or obligation a sample so that you may see for yourself just what we have accomplished in register construction.

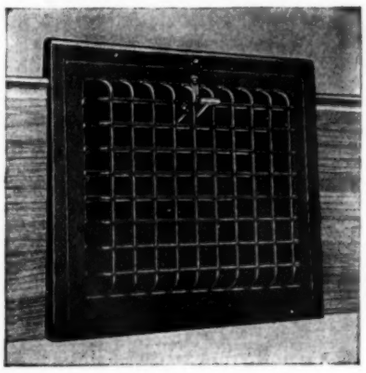
Send for your sample register TODAY

STEARNS REGISTER COMPANY

617 East Fort Street ***Detroit, Michigan***

The New Stearns Register

WALWORTH REGISTERS



Style B

Our Registers both floor and sidewall have greater efficiency and larger capacity for a given size than any other make.

All our baseboard and sidewall Registers are strictly sanitary and can be fastened more perfectly and securely in less time than others, without the aid of any tools.

PLAIN LATTICE Design.

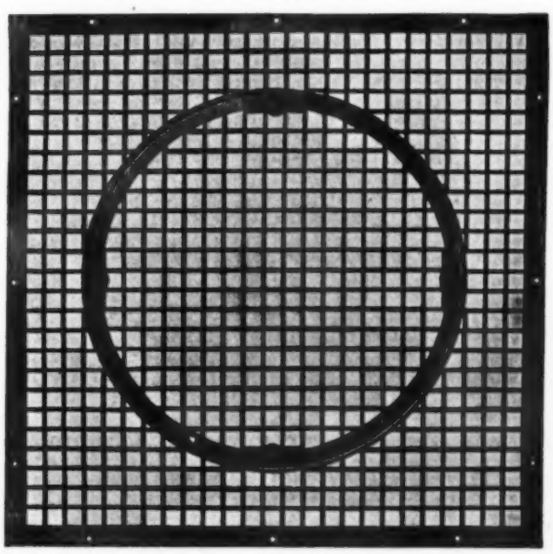
WALWORTH Semi Steel Register Bodies

are made of 20 gauge cold rolled annealed steel lapped corners, eliminating any possibility of coming apart.

WALWORTH DUPLEX GRATING

for pipeless furnaces are made in seven standard sizes from 22 x 24 to 45 x 45.

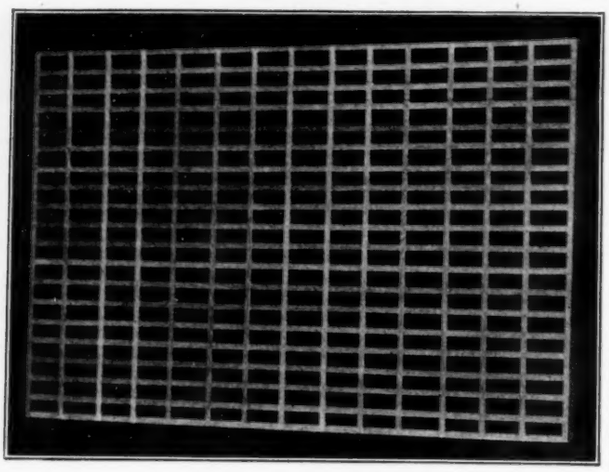
Our stock is always complete and we can fill your orders for any quantity promptly.



THE WALWORTH RUN FOUNDRY CO.

CLEVELAND, OHIO

HART MFG. CO., Southern Distributors, Louisville, Ky.



Eaglesfield

HIGH GRADE

WOOD FACES

EVERY Eaglesfield Wood Face is made of high grade quartered white oak *thoroughly kiln-dried.*

7-16 inch deep cross piece.

Notice that this is 1-8 inch deeper than those used in ordinary faces. We use the highest test Hide flake joint glue; every end piece is secured by nail in each and every stringer.

Every Eaglesfield Wood Face

is finished by hand on sanding machine—

and we thoroughly inspect each face before it leaves the factory.

You will find satisfaction and economy in using Eaglesfield Wood Faces.

Let us give you attractive prices—TODAY.

EAGLESFIELD VENTILATOR CO.

"Sudden Shippers"

920 Dorman Street INDIANAPOLIS, INDIANA

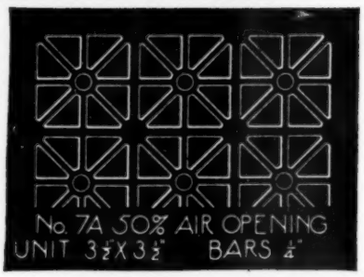
Wrought Metal GRILLES

Brass, Bronze, Steel

Prime Coat Paint, White or Black Japanned or Electro-Plated in any standard finish

Metal 12 gauge and lighter

Any size up to 48" wide, 120" long

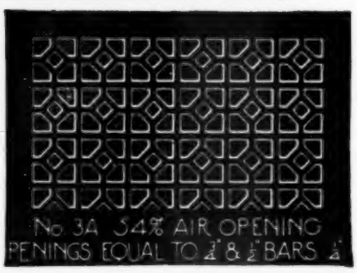


Various Designs and Combination of Designs

For over heating and ventilating ducts, in front of recessed radiators

Quick Shipment

Right Price



THE AUER REGISTER CO.

CLEVELAND, OHIO

This is the

VICTOR *STEEL* FURNACE

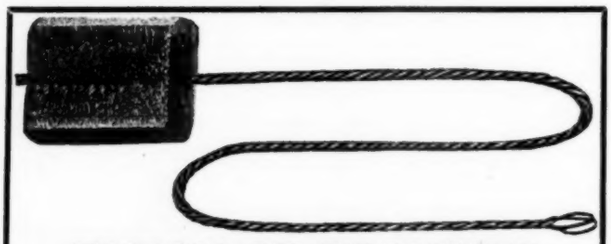
It is proving a Trade and Profit Booster for many dealers. Why not you? Let us tell you about it.

WRITE FOR CATALOG TODAY

HALL-NEAL FURNACE CO.

NOW IN OUR NEW MODERN FACTORY

1322-24-26 N. CAPITOL AVE., INDIANAPOLIS, IND.



FURNACE BRUSHES

Brush is 4" in diameter with two sides flattened, and is constructed of a large number of small steel wires built on a 5 ft. Flexible Handle designed to fit any make of Furnace and many Boilers.

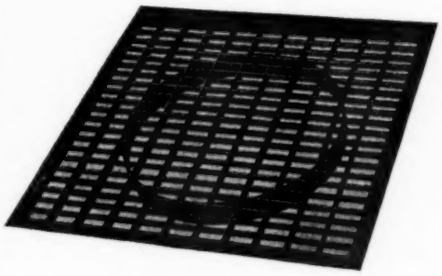
A clean Furnace or Boiler means better draft, more heat and less fuel.

Every Live Dealer should handle our All Wire Brushes for his sake and his customers sake.

One of our ALL Wire Brushes used occasionally will save its owner several times its cost in a single winter.

Write for prices. Send us your order. Display them in your window and see them move.

HARDWARE SPECIALTY COMPANY, Box 446, Fort Wayne, Ind.



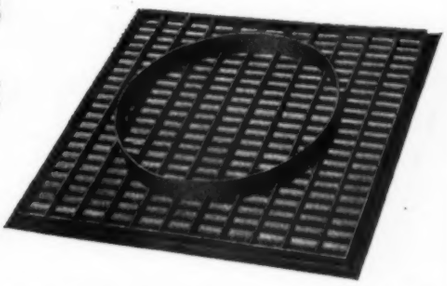
82% Open Area

Independent "Fabrikated" Pipeless Furnace Gratings and Register Faces

The Frame of angle iron, the interior grill of strip steel.

Strong - Rigid - New Low Prices

The "Fabrikated" is worth investigating
May we tell you our story?



Independent Register & Mfg. Co.
Cleveland, Ohio

Install your Pipeless Furnaces the-- ROCK ISLAND WAY

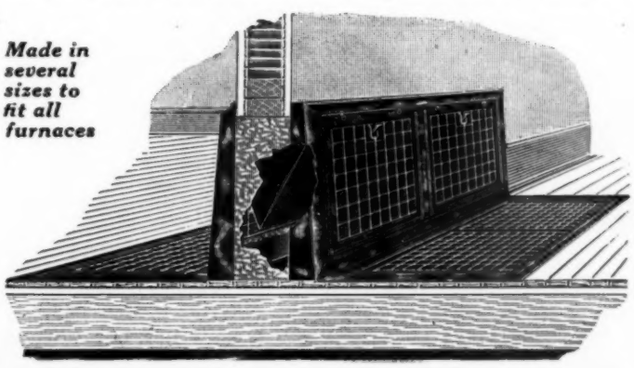
The only system that makes a real heating plant of any pipeless.

INCREASE your Furnace sales by using this ROCK ISLAND SYSTEM. It can be used with any Pipeless or Pipe Furnace and it is GUARANTEED to satisfy.

Heating Information FREE

You need the latest and most completely detailed catalog on Pipe or Pipeless Registers, Piping and Supplies. Learn the Rock Island Method of Installing, that Saves Material and Labor. This new Catalog and Net Price Book gives you all this information and is yours for the return of *this coupon.*

Made in several sizes to fit all furnaces



MAIL TODAY TO

Rock Island Register Co.
Rock Island, Illinois

This Trade Mark! Guarantees Satisfaction

NO STREAK

R. I. Register Company, Rock Island, Ill.

Send Catalog and Net Price Book to—

Name.....

Address.....

A. A.

F. MEYER & BRO. CO.
MANUFACTURERS OF THE
HANDY FURNACE PIPE
REGISTERS, TIN PLATE, ASBESTOS PAPER
ASBESTOS CEMENT AND ALL WARM
AIR HEATING SUPPLIES
FACTORY 916-918 S. WASHINGTON ST.
OFFICE 1310-1312 S. ADAMS ST.
GEO. F. MEYER, President
D. MEYER, Vice President
GEO. HARMS, Secretary
WM. L. LOOK, Treasurer
PEORIA, ILL.
The Handy

Dec. 21, 1921.

American Artisan,
Chicago, Ill.
Gentlemen:-

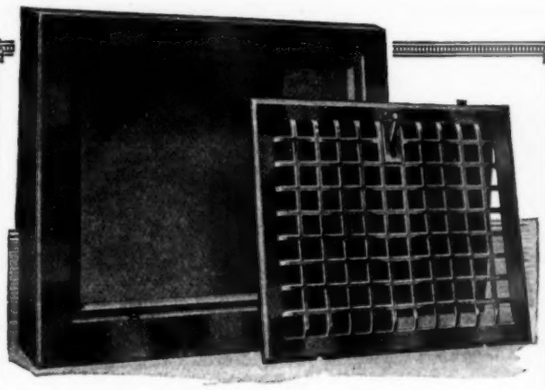
We consider the AMERICAN ARTISAN AND HARDWARE RECORD as the best magazine to advertise our goods. We can truthfully say that we receive more inquiries that can be attributed directly to this advertising, than we do of any other trade paper advertising that we have. Believing that building business for 1922 will open up early, and that the prospect for business is very much better than it has been in the past, we cannot afford to miss an issue in your paper, particularly so that we have reduced the prices on furnace pipe and supplies very materially and there is no better medium to bring this to the attention of the dealers, than the AMERICAN ARTISAN. Therefore, enclose contract covering our advertising for 1922. Wishing you the success that you so justly deserve and with kindest regards from the writer, to the members of your staff, we are

Yours truly,

F. MEYER & BRO. CO.

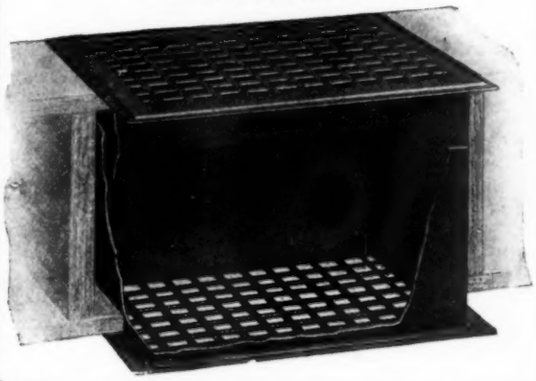
GH/LZ
Enc

per Geo. Harms



The One Register with a
Perfect Adjustment
—and It's Patented

THE AUER REGISTER CO.
Manufacturers
CLEVELAND, OHIO



H&C

Class 200 Floor Registers

The Standard for 20 Years

They have a reputation for surpassing all other registers on the market —either steel or iron.

The special H & C design, including many patented features, provides for easy and quick installation—superior strength and appearance—increased air capacity—resulting in the most efficient and most satisfactory registers made.

A line worth installing because they increase one's good will and business.

The Hart & Cooley Co., Inc.
NEW BRITAIN, CONN.
100 Lafayette St., NEW YORK 73 East Lake St., CHICAGO

MARSH
WOOD FACES

Style 40-C
WOOD FACE
with OBLONG MESH

The Preferred COLD AIR REGISTERS

DEALERS call Marsh Wood Faces "The World's Best." Once they use them they specify Marsh Wood Faces from their jobbers because they know they can rely upon them.

You never used stronger Wood Faces than Marsh Cold Air Registers—we make them strong by using the most scientific manufacturing methods known to the trade.

We use the choicest lumber taken from our own forests—every Marsh Wood Face is perfect in construction and the wood free from flaws.

They are economical—cost less than half the price of cast iron or steel registers and harmonize with the Wood Work in the homes.

Use MARSH WOOD FACES

in connection with your pipeless installations—above the doors, in the baseboard and as air circulation registers in the ceiling. They are more practical and cost less than others.

ORDER FROM YOUR JOBBER

All leading jobbers carry the Marsh line—it is complete—we can furnish you with anything you want in Wood Faces, all of the highest quality.

Write today to your jobber or us for catalog and prices.

We are the world's largest manufacturers of Wood Faces.

THE MARSH LUMBER CO.
DOVER, OHIO

The New Reduced Prices

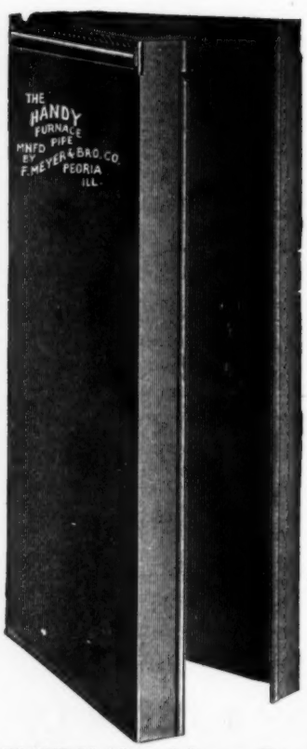
that have been established on

HANDY PIPE

are, considering the wages now paid and the freight costs on our materials,

Very Much Below Pre-War Prices

In fact, we can say in all truth that it is entirely probable that the prices now in force cannot remain thruout the season and that we shall be compelled to advance them.



HANDY Nested Square Pipe

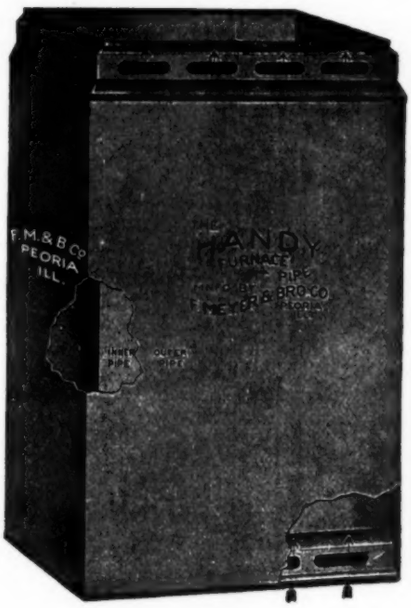
This is not said in order to cause anyone to buy any more materials than he honestly needs; but rather to allow every man to make all the provision he sees fit to do while prices are at the very bottom.

Our Big Peoria Factory Is in Shape to Fill Many Orders Anticipated as a Result of the Price Cut. Our Jobbers, Too, Are Well Stocked.

F. Meyer & Bro. Co.

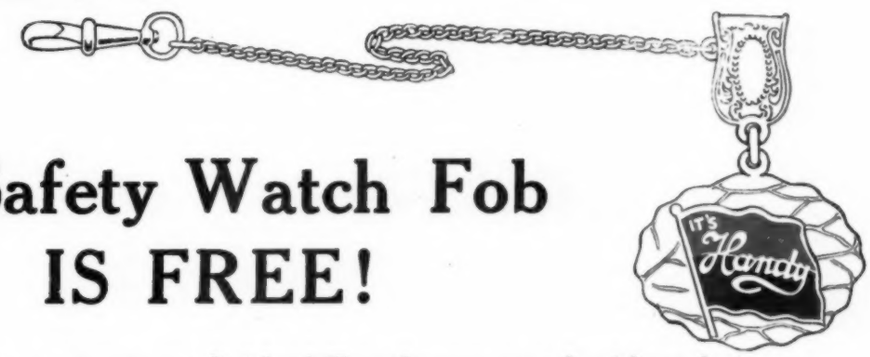
PEORIA - - ILLINOIS

If You Haven't a Copy



of Our Big Catalogue Picturing and Quoting Prices on "Everything Needed in the Installation of Warm Air Furnaces" a Postal Request Will Bring It

Or, better than that, tear out the lower half of this page, answer the questions thereon, and get a handsome watch fob.



This Safety Watch Fob IS FREE!

Made in a permanent finished French grey metal with a chain of soldered links and a clip that takes a "bull dog" grip on the edge of your watch pocket, it is a good fob to have. You can't lose your watch and it can't be slipped out of your pocket. The "Handy" pennant is done in red and blue enamel.

If you will answer the following questions, we'll gladly send you a fob.

Do you install warm air furnaces? .....

Do you read our little magazine "Furnace Installation"? .....

Are you on our mailing list? .....

Would you like to have us send you our catalogue? ..... And our periodical literature? .....

.....

.....

Mail This to F. Meyer & Bro. Co., Peoria, Ill.

Michigan

SAFETY

Furnace Pipe

USE Michigan Safety Furnace Pipe on your next job and notice the difference—notice how well it fits together—examine the joints closely—they're air tight and the stack is solid and smooth both inside and outside.

A Section for Every Need

The Michigan Safety line is complete—short joints enable you to make the most crooked stack without cutting or destroying safety features.

High Quality Bright Tin Plate

Michigan Safety Furnace Pipe is made of the best grade material and manufactured by special machinery. No rivets or solder are used. You want to use a furnace pipe that is **Safe**—easy and quick to install and highly efficient in warm air delivery.

MICHIGAN SAFETY PIPE excels in these features.

Large Complete Stocks —Prompt Shipments

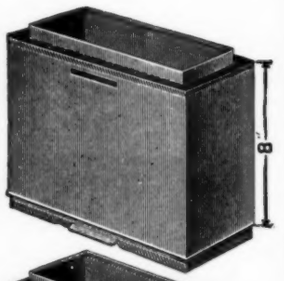
This high grade pipe is being used by thousands of installers because they find it the best although it costs no more than the ordinary kind.

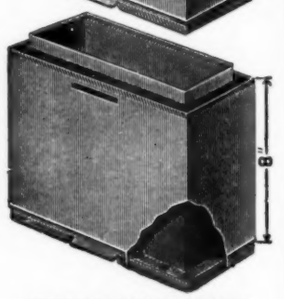
Use some on that next job—compare MICHIGAN SAFETY quality and prices with the pipe you are now using.

Catalog and new price list are ready — Write for yours NOW

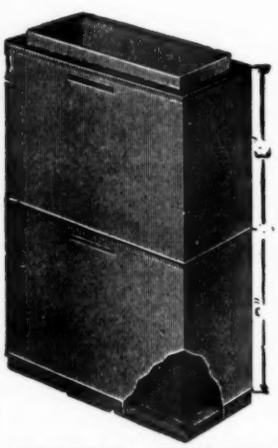
MICHIGAN SAFETY FURNACE PIPE CO.

623 East Fort St. **Detroit, Mich.**

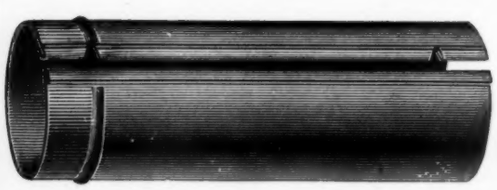


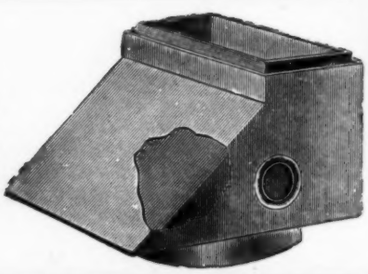


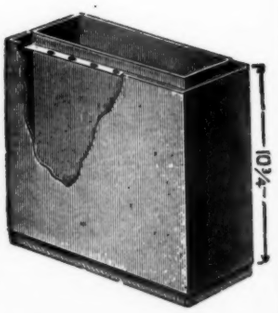
MICHIGAN SAFETY FURNACE PIPE Ready to Connect



MICHIGAN SAFETY FURNACE PIPE Locked Making Air Tight Joint.







"LAMNECK"

TRIFLES MAKE PERFECTION---AND PERFECTION IS NO TRIFLE

There is a large amount of wisdom stowed away in these few words.

The ceaseless effort needed to convert seeming trifles into perfection spells the difference between mediocrity and superiority.

Very often a large portion of this effort goes by unappreciated by the casual observer.

We know no place where this constant endeavor for perfection is more in evidence than in our factory.

Were you able to make a personal tour and watch our products in the process of manufacture, you would more readily comprehend why our output stands for perfection in its line.

It is because we watch the trifles which make for perfection.

THE ONLY WAY TO INSURE A PERFECT INSTALLATION IS TO USE NOTHING BUT FITTINGS WHICH ARE PERFECT. ¶ EASY TO INSTALL, SIMPLE IN CONSTRUCTION, LAMNECK FITTINGS ANSWER EVERY REQUIREMENT AND DELIVER ONE HUNDRED PER CENT SATISFACTION. SO WHY TRIFLE WITH MAKESHIFTS?

ANOTHER LAMNECK INNOVATION
A single boot with a double head. Double protection for all parts which come in contact with wood. Solid and rigid, they fit either double wall pipe or double baseboard stack heads. They insure perfect insulation at the price of a single boot. Look them up in our catalog.

Are you using our catalog and reading "FITTING REMARKS"--Your name brings both

The W.E. LAMNECK CO.

COLUMBUS ~ OHIO

EVERYTHING FOR THE SHEET METAL WORKER AND FURNACE MAN

History of the Kitchen Range

THE past fifty years have seen a wonderful development in the manufacture and sale of kitchen ranges, and at the request of several of the prominent manufacturers in this important field, we shall in the near future publish a review of the many improvements in the methods and materials that enter into the making and selling of kitchen ranges.

These requests were made because these manufacturers realize that

AMERICAN ARTISAN AND HARDWARE RECORD

is the only trade publication which for years has consistently devoted considerable personal effort and much editorial work toward the progress in this field.

Our 1921 Warm Air Heater Special, in which this announcement appears, will give you a fair idea of the thoroughness and care with which this review is being prepared, and will also serve as an indication of the elaborate manner in which the subject will be presented in picture and words in our

1922 Kitchen Range Special

A number of reservations for liberal advertising space have already been received for the 1922 Kitchen Range Special. Regular advertising rates will apply notwithstanding the heavy cost of the preliminary work, such as collection of data, making of illustrations of old range types, etc.

Make Your Reservations NOW

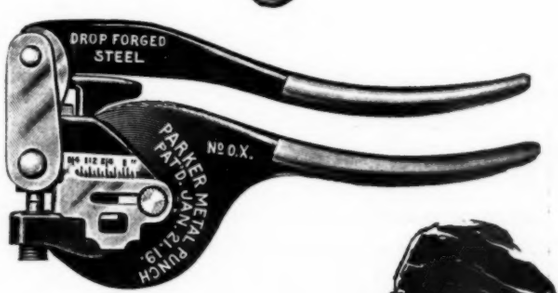
First come, first served. The most desirable positions will naturally go to those who send in their orders for space early.

AMERICAN ARTISAN AND HARDWARE RECORD
620 South Michigan Ave. **Chicago, Illinois**

Sheet Metal Workers

Everywhere---"Pin their faith" to

Parker Products



Parker Hardened Sheet Metal Screws save so much over the cost of using bolts, that they are indispensable to the man who watches costs. They cut their own thread in a punched or drilled hole and join or make fastenings to sheet metal more firmly than other methods. They hold like grim death —vibration cannot loosen them.

If You Are Not Using Them You Will Want To—For The Greater Profit They Will Bring You On Any Sheet Metal Job.

Parker Damper Quadrants and **Dial Damper Regulators** are conceded by Heating and Ventilating Engineers, Architects and Sheet Metal Contractors to be the neatest and most efficient devices for the regulation of dampers in hot or cold air ducts, blow pipes, smoke pipes, etc. They have been used in some of the world's largest and most prominent buildings, among those being the Woolworth and Equitable Buildings in New York, the Bellevue-Stratford Hotel, Philadelphia, the Bureau of Engraving and Printing in Washington, and hundreds of others. They are furnished in sizes suitable to dampers of any size.

Parker Metal Punches No. OX, a Hand Punch, and No. X. X., a Combination Bench and Hand Punch. They are the first choice of the experienced sheet metal worker. He knows that "the stuff is in 'em"—he has found that the use of drop forgings, the heat treating and oil tempering of the wearing parts, of which there are few, give Parker Punches an unequalled stand-up ability.

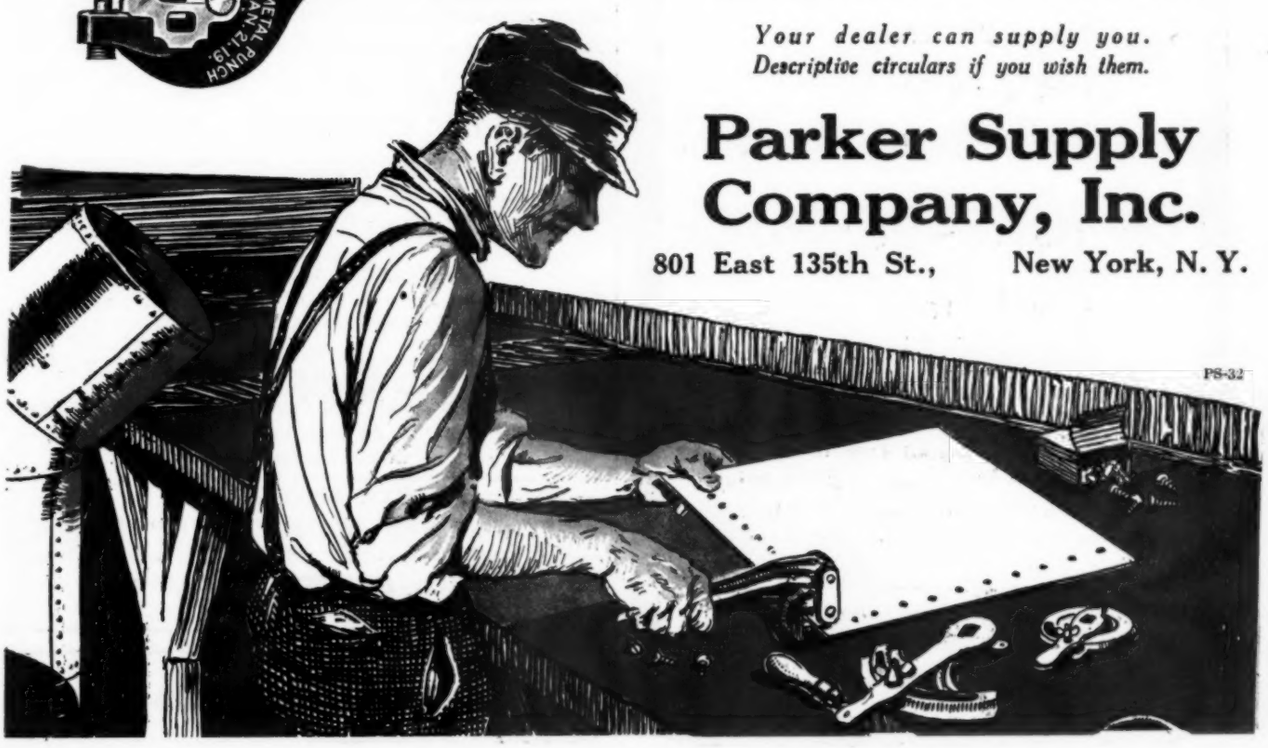
He uses Parker Punches in the shop and on the job because he can depend upon them to serve him in a pinch. ***They have greater punching power than any tools of similar size,*** and the many labor saving features embodied in the Punches cut the cost of punching holes.

Remember! If It Isn't a PARKER It Isn't the Best

Your dealer can supply you.
Descriptive circulars if you wish them.

Parker Supply Company, Inc.

801 East 135th St., New York, N. Y.



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Buy

Dangler
Wick Oil Stoves
Now

There is going to be a big call for these high grade Dangler Wick Oil Stoves—and you won't be prepared to secure the sales unless you have the stock on hand.

Dangler Prices Are Low Now

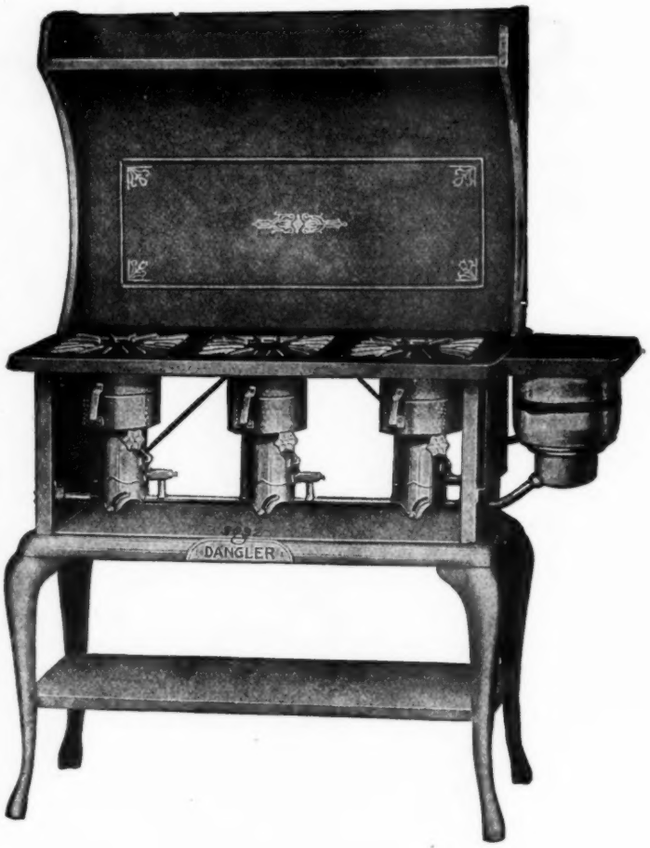
on this full line of neat, durable and efficient Wick Oil Stoves.

Dangler dealers are ordering now and getting samples on their sales floor.

They are preparing for the big demand and clinching the extra sales now because of Dangler low prices and high quality.

Our catalog illustrates and describes our entire line—write for it and full details today.

DANGLER STOVE CO.
Div. American Stove Co.
CLEVELAND, OHIO



Black Silk

Stove Polish
Iron Enamel
Metal Polish
Wire Screen Enamel

One Name—One Quality

Good Profits
Satisfied Customers

Our products are all of the best quality we can make. If your customers are not satisfied with **Black Silk** goods we authorize you to refund their money and we will in turn reimburse you.

Buy through your jobber

Black Silk Stove Polish Works, Sterling, Ill.

FURNACE REPAIRS

Our Catalog listing the most complete line of repair parts is ready. It will increase your business. Send for it.

Parts for "any old stove" also. Address Dept. A

The National Stove Repair Co.
235 Sycamore St. Cincinnati, Ohio

PATTERNS
FOR STOVES AND HEATERS FIRST-CLASS IN WOOD and IRON
VEDDER PATTERN WORKS ESTABLISHED 1838 **TROY, N. Y.**

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for
FURNACES AND HEATERS
30 years experience. Full size drawings from your data.
THE TAFT METAL PATTERN & MFG. CO.
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IRON AND WOOD
STOVE PATTERNS
QUINCY PATTERN COMPANY
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See the Wants and Sales pages.

Complete Equipment

for making

FURNACE PATTERNS

LARGE OR SMALL
PLAIN OR ALL DRESSED UP

OUR thirty years of experience in making high class furnace patterns is yours for the asking.

Let us have your pet ideas for your pet furnace and we will do the rest. From drawings to the finished patterns.

Write today for full information

A Fire Pot Full of Pattern Makers (830 lbs.)

Largest All Cast Warm Air Furnace ever built.

THE GEO. E. SHAW & SON CO.

1362 East Third Street **Cleveland, Ohio**

REPAIRS

TO FIT
STOVES and FURNACES

We carry in stock repair parts for over **200,000** different **STOVES & FURNACES**

You can be almost certain, that if a repair part is obtainable, no matter how obsolete, we can furnish it. You will realize a great saving in time and money by sending us your orders.

Write for duplicate order book

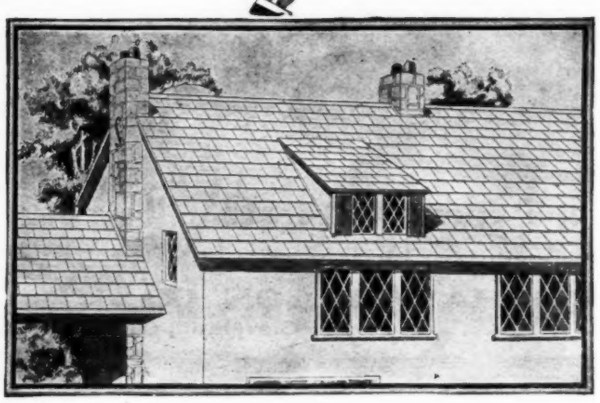
NORTHWESTERN STOVE REPAIR CO.

654-666 West Roosevelt Road **CHICAGO**

ILLINOIS

ZINC SHINGLES

The Roof that's Always New!



A Roof of Metal Shingles with a Butt-Shingled Effect

IT'S not just because they're made of indestructible zinc which will long outlast the building.

Your customers will choose them for their *appearance* alone.

Assembled on a roof, the Illinois Zinc Shingles (preoxidized at the factory) are as beautiful, and in many cases *more* so, than tile, slate, wooden shingles or the shingles made from asphalt and other substitute materials.

And that is why these metal shingles are being specified today by architects, and are being selected by owners and contractors in preference to all other forms of roofing.

Illinois Zinc Shingles are not plated or coated. They are *pure zinc* all the way through.

Our manual for building supply dealers will show just how you can sell these shingles for almost every roofing job in your vicinity. Write for samples and full details.

ILLINOIS ZINC COMPANY

Sales Offices:

280 BROADWAY, NEW YORK
820 BRUNNER ST., PERU, ILL.
SMELTERS & ROLLING MILLS, PERU, ILL.

Established 1870

CORRUGATED ZINC SHEETS FOR ROOFING AND SIDING
ILLINOIS ZINC SHINGLES—STRIP OR RIBBON ZINC
SLAB ZINC (SPELTER)—WIDE ZINC SHEETS

Producers of Electrolytic Slab Zinc guaranteed 99.99% pure zinc. The highest grade of Slab Zinc produced in the world.

¶ Not only is the Illinois Zinc Shingle everlasting—not only is it artistic—but it's the most convenient and practical form of shingle ever devised. Every sheet metal worker should at least investigate this revolutionary roofing.

Regulators—Damper.

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Schools—Automobile Radiator Repairing.

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Illinois Zinc Co., New York, N. Y.

Zinc—Slab.

Illinois Zinc Co., New York, N. Y.

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For paid yearly subscribers, AMERICAN ARTISAN AND HARDWARE RECORD will insert under this head advertisements of not more than fifty words *WITHOUT CHARGE*. Employers wishing to secure employes, parties desiring to purchase or sell business, secure partners, or to exchange, etc., will find that these pages offer excellent opportunities to satisfy their wants. Clerks and tinsmiths looking for situations will find it to their advantage to use these columns. Those who respond to these announcements please mention that they "READ THE ADVERTISEMENT IN AMERICAN ARTISAN AND HARDWARE RECORD."

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For Sale—Tinshop. Established three years. 2018 Lawrence Avenue, Chicago, Illinois. Tel. Ravenswood 1234. 25-3t

Wanted—I have a good farm, well improved, near good town. Will exchange for established hardware business. Box 252, Pierceton, Indiana. 27-3t

For Sale—One detachable piano player with about 100 rolls of music; worth $150; on account of moving will take $50 cash F. O. B. Kansas City. Address J. Oscar Smith, 2833 Woodland Avenue, Kansas City, Missouri. 25-3t

For Sale—Good clean stock of Hardware and Fixtures, at $5,000, below present inventory prices. Prominently located in city of six thousand. We must dispose of this before we can close up the estate. Reed Hardware Company, Three Rivers, Michigan. 3-ufn

For Sale—A clean stock of hardware and sheet metal shop in connection. Doing a good business. Will sell at the right price. About 40 miles from Chicago. Address A-2, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

For Sale—Sheet Metal and Roofing business in town of 15,000 in Central Nebraska. Annual business about $40,000. Reason for selling, am interested in other business. Address A-9, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

For Sale—Good clean stock of hardware, furniture and rugs, also have a tin shop in connection with the store. Prominently located in a town of two thousand. For full particulars address A-3, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-3t

For Sale—Auto radiator repair shop, furnace, plumbing and tin business, in a town of 3,000. Only shop of its kind in town and miles around. Good reason for selling; have other business to look after. Address B-97, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

For Sale—Hardware store and stock in town of about 500, terms right. $5,000 will turn the deal clear. In the heart of a fine farming country. The best chance in Northern Michigan. On the Trunk Line Highway and Pere Marquette Railroad, thirty miles north of Grand Rapids. Reason for selling, old age. Address James E. Sharp, Grant, Michigan. 27-3t

For Sale—Hardware stock, building and implement stock. This is a going concern with no dead stock. Must be seen to be appreciated. Come and look it over. Traders or agencies need not apply. This is strictly a first-class opportunity for a young business man with some money. Address B-99, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

For Sale—Hardware and Tin Shop. County seat, 7,000 population. Good prospects for future. Midway between St. Louis and Springfield, Illinois, on Illinois Traction and C. and A. R. R. $15,000 cash business last year. Store in operation only 18 months, shop 11 years, has a good following, mostly cash. Best equipped shop in town. 31 furnaces sold this season. Prospects are good. Store trade steadily on the increase, well advertised. This business can be had for cash on or before February 1, 1922. Not for sale after that date. Carlinville Hardware Company, Carlinville, Illinois. 27-3t

BUSINESS CHANCES

Lightning Rods—Big profits and quick sales to live dealers selling "DIDDIE-BLITEN RODS." Our copper tests 99.96% pure. Prices are right—get our agency. L. K. Diddie Company, Marshfield, Wisconsin.

Wanted — Location for Auto Radiator Repair Shop, or would buy out Radiator and Tin Shop. Please state particulars in first letter. Address B-93, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

Shop for Sale—The best offer made me between now and January 15th goes, as I must prepare to leave the State. County Seat 2,000. Paved streets, four brick churches, good schools, three banks. 17 furnaces installed this year, 23 last year and 30 the year before. Come and look the deal over. A. J. Bridges, South Court Street, Bedford, Iowa. 26-3t

Surplus Stock Below Market—100 8-in. galvanized furnace elbows, at 29c; 30 bundles 28x24x101 blk. stove pipe iron, at 3½c; 100 dozens ½-⅝ and ¾-in. brass hose couplings at $1.20; 10 assortments of 1,000 stove bolts at $2.50; 10 assortments of 1,000 carriage bolts at $7.50; 10 assortments of 1,000 machine bolts at $10; 10 assortments of 50-lb. rivets at $2.50. Vandervoort Hardware Company, Lansing, Michigan. 25-3t

HELP WANTED

Wanted—First class outside tinner to invest $750 as one half interest in going Sheet Metal and Furnace Shop. Have all good tools and good stock. References exchanged. F. C. Seeger, 660 3rd St., Milwaukee, Wisconsin. 25-3t

Wanted—A first class sheet metal, roofing, cornice and furnace man, with all around ability, one that can take work from pattern bench to comp'etion of job. John J. Beard Sheet Metal Works, 559 West Main Street, Lexington, Kentucky. 27-3t

Wanted—By March 1st. A combination tinner and plumber would consider partnership with firm, in southern Wisconsin. Must be a good mechanic at good pay. Address A-7, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

Wanted—First class radiator repair man and tinner. Would prefer one that can do plumbing. In good South Dakota town adjacent to Sioux City, Iowa. State wages you would want for a steady job. Address A-11, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-3t

Wanted—Foreman for sheet metal shop, doing general work, such as cornices, sky lights, ventilating, guttering, etc. Must be first class. Write us, giving age and experience. Open shop. Good wages for right man. Hugh L. Turner Sheet Metal Company, 720 West Second Street, Oklahoma City, Oklahoma. 27-3t

SITUATION WANTED

Situation Wanted—By a first class sheet metal worker and furnace man. Steady job with good firm. State hours and wages in first letter. Address 3557 11th Street, Rock Island, Illinois. 26-3t

Situation Wanted—By young tinner and plumber, have had ten years' experience. Best of reference. State wages and full particulars in first letter. Address J. H. Dennick, 385 East First St., Spencer, Iowa. 25-3t

Situation Wanted—By a man holding foremanship for five years and has had twenty-three years' experience in stove making and hotel equipment. Address B-95, % AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

Situation Wanted — By a first-class sheet metal worker and hot air furnace man at once. State wages and hours you work and full particulars in first letter. Address B-98, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

Situation Wanted—By first-class sheet metal worker and furnace man with twenty-five years' experience. Steady employment desired. State wages and full particulars. Address A-5, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-3t

Situation Wanted—By an all around sheet metal worker, mechanic, foreman and estimator. Can do anything in the sheet metal line. 50 years of age. Can go anywhere, but prefer Ohio. Address B-96, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

SITUATION WANTED

Situation Wanted—By January 1, 1922, by a good sheet metal worker. In and out door work, guttering, roofing, furnace and all repair work. J. J. Martin, 1211 Sigler Street, Nashville, Tennessee. 27-3t

Situation Wanted—By a first class all around sheet metal worker, want good position. Can give best of references. Address A-6, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

Situation Wanted—By a good all-round tinner and warm air furnace man, at once. Married and desire steady work. State full particulars in first letter. Address A-10, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-3t

Situation Wanted—As hardware clerk; have had 9 years' experience in wholesale hardware. Steady employment only. Best of reference. I am a married man. State wages and full particulars in first letter. Oscar C. Taege, 312 Fremont St., Arlington Heights, Illinois. 26-3t

Situation Wanted—On salary and commission basis, open for engagement Jan. 1st. The furnace business here on the Pacific Coast has been fine during the past two years and it's surely going to be still better in the next few years, until 1925. If you want to know why address A-8, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

Situation Wanted—By hardware clerk, experienced, can also do shop work. Thirty-five years old, married, good habits, steady worker, no cigarettes, good penman, some knowledge of bookkeeping, desires position with well established firm. References. N. Dakota, South Dakota or Minnesota territory. Can start to work January 1st. Address Lock Box 233, Edgeley, North Dakota. 27-3t

Situation Wanted — By a first-class combination plumber with hardware experience. Can furnish references on branches of heating, inspected plumbing and electric wiring. Desire to connect with a progressive hardware store. Am middle aged and married. Steady position preferred where a working interest could be secured. Have plenty of tools. Address A-1, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

TINNERS' TOOLS

For Sale—A set of tinner's tools, including 8-foot brake and 30-inch square shears. Priced to sell. A. E. McClaflin, Bicknell, Indiana. 25-3t

For Sale—1-30" Stove Pipe Folder, $12; 1-20" Grooving Machine, $14; 1 Upright Double Seamer, $18; 1 Horizontal Double Seamer, $16; 1 large size Circular Shears, $26; 1 pair 9" Jaw Stock Shears, $5; 1 pair 20" Roller, $7. C. E. Whiteley Sheet Metal Works, Sulphur Springs, Texas. 25-3t

SPECIAL NOTICES

Special Notices — displayed want ads—are charged at the rate of $3.00 per inch per insertion.

PATENTS
HUBERT E. PECK
Patent Attorney
Pacific Building, WASHINGTON, D. C.

WARM AIR HEATER SALESMAN WANTED

For Illinois territory, high grade line. Write in detail giving your qualifications to D-89 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago Illinois. 26-1

SPECIAL NOTICES

WANTED

A first class sheet metal worker to take charge of the furnace sheet metal department. All inside work. Steady job. Must be an A-1 mechanic with executive ability. Howard Stove & Furnace Company, Ralston, Nebraska. 26-3t

SALESMAN WANTED

Experienced Stove and Furnace Salesman. Choice Territory. Give references and experience. Security Stove and Mfg. Co., Kansas City, Missouri. 23-8t

FURNACE SALESMAN WANTED

Experienced and capable man to represent a standard line of cast furnaces. One with a good acquaintance in Wisconsin and Iowa. Write D-97 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-ufn

SITUATION WANTED

By a Stove and Furnace salesman to represent an up-to-date line of Stoves and Furnaces in Wisconsin and Upper Michigan, can give good references and take care of stock. Address D-91 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

WANTED FOR 1922

For Wisconsin territory. Line of Coal and Wood Heaters, Gas Ranges and Gas Heaters, Steel and Cast Ranges, Warm Air Furnaces. Lines must be up-to-date and first-class. Covered territory 20 years, Last four years with one firm. What have you to offer? Address D-94 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-1t

ADVERTISING MANAGER

with initiative and pep by established Warm Air Heater Manufacturer. Must be competent to prepare "live wire" sales literature for the manufacturer and sales helps for the dealer. Address in strict confidence, giving full details of your qualifications, salary desired, etc., D-1, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-3t.

SPECIAL NOTICES

SPECIAL NOTICES

Catalogues and Price Lists

WANTED on sheet metal and roofing products for the Reference Library of the Detroit Sheet Metal Contractors Association. Send same to

A. J. Rasch, *Secretary*

2002 Real Estate Exchange Bldg. Detroit Michigan

SALESMEN WANTED

SALESMEN calling on the Wholesale and Retail Hardware, Stove, Furniture and Department Stores, Liberal Commission, Exclusive territory, Active Men can add from one to two thousand dollars a year to income; price list and sample can be carried in pocket; write to American Mica Products Company, 177 North State Street, Chicago, Illinois. 25-ufn.

SALESMEN WANTED

Experienced furnace salesmen to carry as a side line on commission an up-to-date WARM AIR FURNACE line. State age, experience, references and territory desired. Address D-98 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-1t

WANTED—HIGH GRADE FURNACE SALESMEN

We desire to obtain the services of high grade salesmen to represent our superior line of well known furnaces in Indiana, Illinois, Michigan and Wisconsin. We have a real proposition to offer you if you are a go-getter. Write today and tell us about yourself and what you can do.

TAPLIN FURNACE COMPANY
MAKERS OF HEATERS
GRAND RAPIDS, MICHIGAN
24-3t

WANTED EXPERIENCED STOVE SALESMEN

By an old and large stove manufacturing concern located in the central west. Experienced stove salesmen for Indiana, Ohio, Illinois, Iowa, Kentucky, Wisconsin and Minnesota. Prefer salesmen with established trade in these territories. Strictly up-to-date lines of Cast and Combination Gas and Coal Ranges in blue and grey enamel, Steel Ranges, Cooks, Soft and Hard Coal Heaters. Salary or commission or both. Give full particulars as to experience, age, salary and references in first letter. Address D-96 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-2t

TRAVELING SALESMAN WANTED

Have open territory, Indiana and Southern Michigan. Give complete information, including sales record past three years, age, nationality, etc.; also references. The Lennox Furnace Company, Marshalltown, Iowa. 27-3t

A REAL PROPOSITION FOR SALE

The Patterns, Trade Name and All Rights to one of the

BEST KNOWN RANGES

in the States of New York, Vermont, Connecticut, in fact most of New England. Reputation the BEST with both dealers and users. Always was a good money maker.

WILL BE GOOD MONEY MAKER FOR JOBBER

who wishes to own his own patterns, or Manufacturer who would like trade in the States mentioned.

PRICE MODERATE

for what we have to offer. Address D-99, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 27-1t

EXPERIENCED STOVE SALES MANAGER WANTED

Experienced Stove Sales Manager who has had actual experience managing stove salesmen—none other need apply—for an old and large manufacturing concern located in the central west, manufacturing an up-to-date, complete line of Cast and Combination Gas and Coal Ranges in grey and blue enamel, Steel Ranges, Cooks, Soft and Hard Coal Heaters. Give full particulars as to experience, age, salary and references in first letter. Address D-95 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-2t

SPECIAL NOTICES

ATTENTION OF SALESMEN

Jobbers and Sheet Metal Contractors. Would like to communicate with several live wires that have following. To sell one of the best selling articles in the building line. Note page 146 of this issue. Sylvan Sheet Metal Products Company, 3155 West Grand Avenue, Chicago, Illinois. 9ufn

WANTED EXPERIENCED FURNACE SALESMAN

For our full line of pipe and pipeless furnaces, in Eastern, Southern and Western Territory. Address The Wise Furnace Company, Akron, Ohio. 22-ufn

STOVE SALESMEN FOR 1922

Experienced Stove Salesmen wanted for Indiana, Ohio, Illinois, Iowa, Kansas, Nebraska and Missouri. Prefer salesman with established trade in these territories. Strictly up-to-date lines of Cast and Steel Ranges, Combination Coal and Gas Ranges, Base Burners, Oak Stoves and Furnaces. Salary or commission or both. Give full particulars as to experience, age, salary and references in first letter. Independent Stove Company, Owosso, Michigan. 16-ufn

C. G. HUSSEY & CO.

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PITTSBURGH, PA.

MANUFACTURERS

Sheet Copper, Bottoms, Roll Copper, Tinned and Polished Copper, Nails, Spikes, Rivets, Conductor Pipe, Eaves Trough, Elbows, Shoes, Mitres, Etc.

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The
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Rain-Water Cut-Off

The strongest, most durable and cheapest CUT-OFF on the market.

The only single cut-off made to fit Corrugated and plain pipe and which can be used without extra pipe or elbows.

FOR SALE BY ALL LEADING JOBBERS

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YALE

Russia finish patent Lock

STOVE PIPE

It is made of a very high grade of uniform color Blue Polished Steel and is coated to prevent rusting. Made in all sizes. Packed twenty-five and fifty joints to crate. For sale by the Jobbing Hardware Trade throughout the United States.

Manufactured by

HEMP & CO.
ST. LOUIS, MO.

In the event your jobber does not handle this pipe send your inquiries to us.

Apollo Nickelzinc

Mirror-finish-Pure Nickel Surface Sheet Metal

Non-rusting, easily applied. Sanitary. Without equal for Kitchen Cabinet, TableCovering, Trimmings, Built-in Pantry Shelving, Wash Boilers, Back Boards and Drains for Kitchen Sinks, Back-bar Boards, Light Shades and Reflectors. Stove Boards, Wash Machines and 101 other purposes. **Better—yet Cheaper Than Copper.**

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Kimball ELEVATORS AND DUMB WAITERS

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on the subject of

AUTO RADIATOR REPAIRING

JUST OFF THE PRESS

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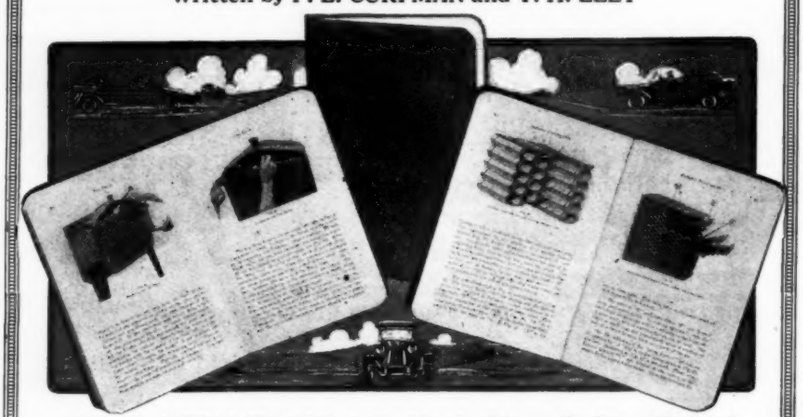

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185 PAGES—120 ILLUSTRATIONS

most of which are reproductions from photographs showing the actual work. Describing in detail the construction of nearly every radiator met with on popular cars.

12 CHAPTERS DIVIDED INTO 60 SUBHEADS

Giving proven methods of repair with the soldering iron and torch. Together with the late process of repairing frost broken tubular radiators by pouring molten solder through the core.

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We show you a few of our specialties on this page and list a few others:

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SHEET METALS OF ALL KINDS

Our large catalog lists practically everything in your line and it also contains much information which you will find interesting.

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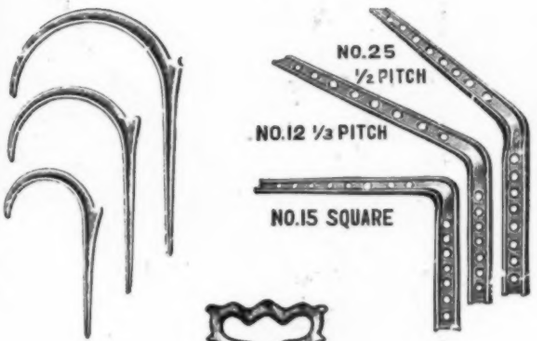

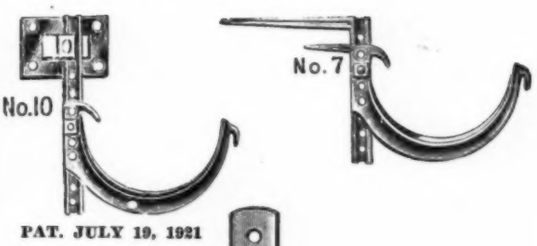

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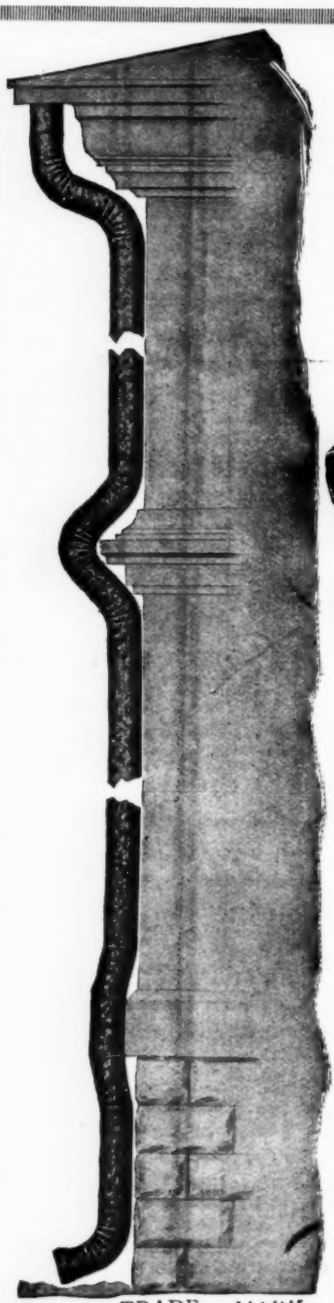
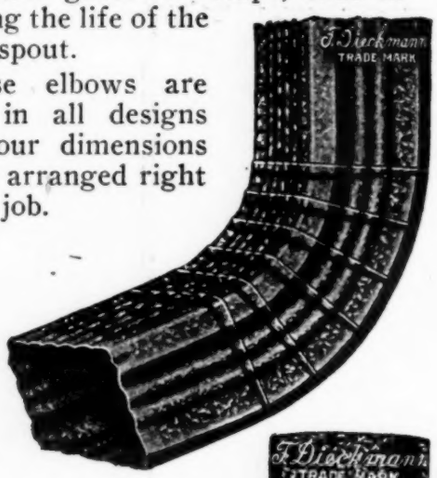


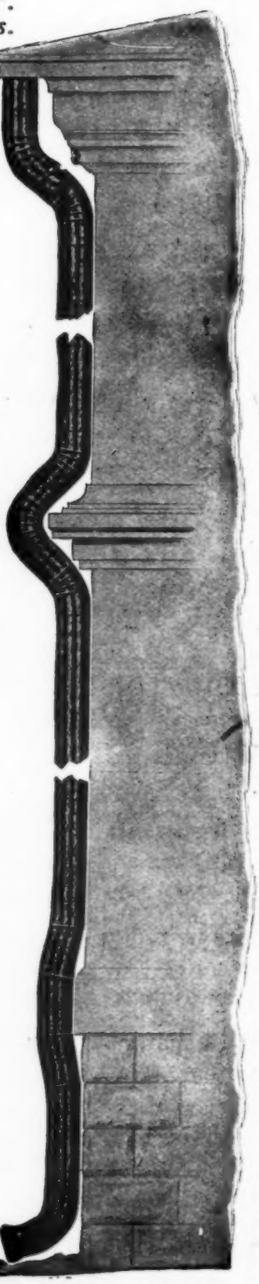
Illustrations show elbows of all angles from 10 to 90°. Note how close each cluster of elbows hugs the walls.

Use short angle elbows to get around sills, cornice mouldings and all other projections, thus preventing the commonly known soldered break in the pipe.

By using combinations of this kind, soldering is not necessary as elbows fit into each other very snug and the small opening at the joints will permit sewer gases to escape, thus increasing the life of the entire spout.

These elbows are made in all designs and your dimensions can be arranged right on the job.





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Lasts Like Copper at Half the Cost

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ZINC ROOFINGS

ZINC roofing solves the problem of overhead covering. It lasts a lifetime—does not rust; needs no painting. Not affected by the weather. Anybody can put on Old Chateau.

It is made in all sizes in corrugated and V-crimp patterns.

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PROPER ventilation is more important in winter than in summer. Therefore right now is a good time to go after ventilating business. The Sylvan is a combination Skylight and Ventilator—easy to operate—stormproof—rigid—and made of first quality materials throughout.

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Let us tell you all about it.

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Blow Torches and Stoves

For Gasoline

have an extremely powerful flame. They are made of the best material that can be obtained and their construction insures long serviceability.

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Div. American Stove Company

825 Chouteau Avenue St. Louis, Mo.

This design is an exact reproduction of Dragon we designed and manufactured of heavy Sheet Zinc. Four of these Dragons were placed on the Chinese Pavillion erected in the Zoological Park, St. Louis, Mo.

This design measured 6 feet 2 inches by 3 feet 9 inches.

Let us figure on your next order. We are equipped to manu acturer any design of Sheet Metal on short notice, and shall be glad to quote prices on receipt of sketch. We always carry a large variety of Stamped Brackets, Modillions, Letters, Enrichments, Finials, etc. in stock.

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Mfrs. High Grade Appliances

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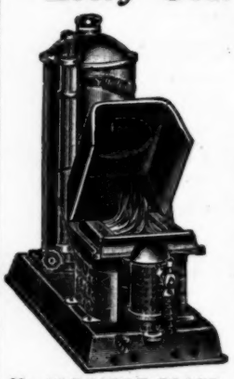

No. 25 DOUBLE BLAST Tinners' Fire Pot

DOUBLE BLAST

Gasoline Burning

FIRE POTS

You waste no heat or fuel when you use them because the **TWO** hot blast flames are forced to the center of the burner. The fuel always burns with a blue flame.

Our **No 25 DOUBLE BLAST FIRE POT** shown herewith is guaranteed to heat soldering irons **TWICE AS FAST** as any other fire pot made, and with **ONE-HALF** the gasoline the others use.

This is an excellent fire pot and one that will stand up under hard use. We would be glad to give you more information and prices on this and other models.

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Look over your stock of TORCHES and FURNACES now. If it is not complete place an order at once so you will receive the tools before the cold weather arrives.

You know that during the cold weather there is an unlimited demand for TORCHES and FURNACES. If you are short of those tools then you cannot complete promptly all of the orders you receive.

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Jobbers supply at factory prices

OTTO BERNZ CO., NEWARK N. J.

Established 1876

Manufacturers of the

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No. 208 Torch
List Price Each $17.00
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The No. 208 Double Needle Torch has wonderful generating power and produces the maximum heat. This, with other Improved Features makes it the most dependable Torch for use in extremely cold and windy weather. Burner orifice is automatically cleaned by upper Needle, lower Needle regulates. Burns Gasoline or Kerosene by changing the Jet Block. Impossible to ruin the Burner by enlarging the orifice as with other makes having Sharp Pointed Needle. Always reliable. Jobbers supply at factory prices. Send for catalogue now.

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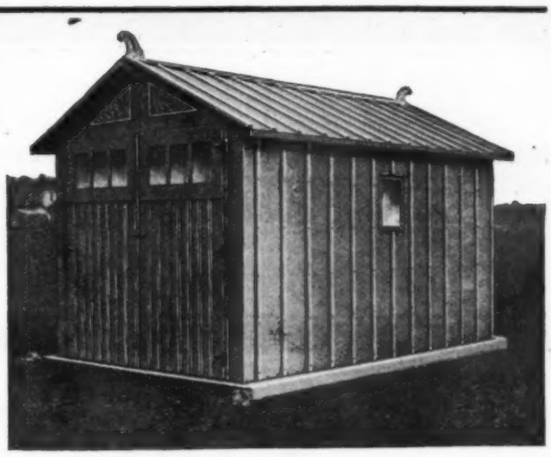

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BUCKEYE Ventilators, Metal Shingles, Heat Radiator Shields

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Most Durable, Easiest Operated, Low in Price. Made in All Lengths and to Bend All Gauges of Metal. Over 15,000 in Use.

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When it comes to Galvanized Shingles, use Cortright Hand Dipped. They are first formed of prime roofing tin, and then coated separately in a zinc bath, receiving a heavy coating on both sides.

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We make a complete line of shears, punches and bending rolls, all sizes for hand or belt drive. Write for Catalog "S."

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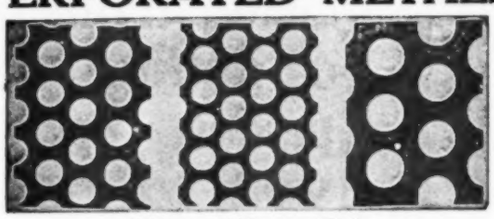

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In Steel, Zinc, Brass, Copper, Tinplate, etc.
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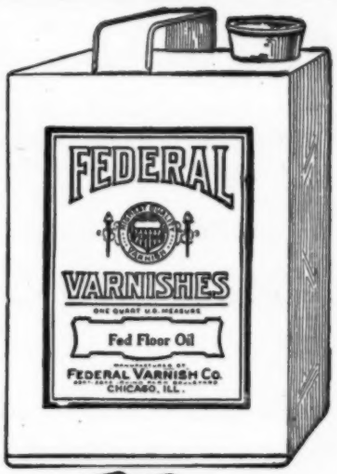

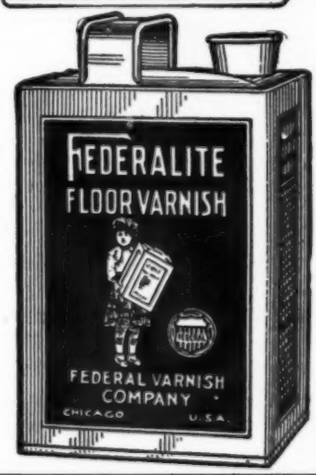

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Let us send you an attractive window display card and a supply of booklets which will get sales for you.

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—was the way a customer put it to us. "If I could find the right stores where the people pass, I'd make $50,000.00 a year! I find that there are millions of blades, knives, scissors, shears, barbers' clips, horse clippers clips, chisels, etc., to sharpen. It is only a case of getting in a good window where the people pass, that is all."

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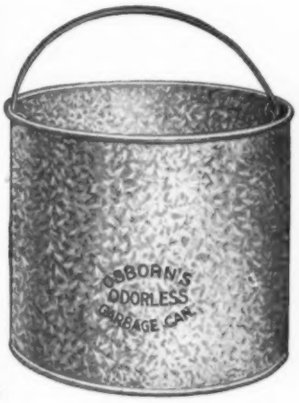

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Full five gallon capacity. Cover constructed as the container for disinfectant, ordinary lime. This is sifted over contents of can by mere closing down of cover.

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Sheet Metal Workers' and Furnacemen's Supplies

THE NAME "COES"

on a wrench is a guarantee of

Service
Durability
Strength
Satisfaction

"Coes" wrenches are well known—as staple as nails. They are guaranteed to have 30 per cent greater strength than other makes.

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WORCESTER, MASS.

"YANKEE" VISE

FOUR SIZES

With Detachable Swivel Base

Four Sizes:	No. 1991	1992	1993	1994
Jaw Opening	1½"	1 15-16"	3⅛"	4"
Height Over All	3⅛"	4⅛"	5¾"	7⅝"
Length Over All	4⅝"	6"	8¾"	12¼"
Net Weight	3 lb.	6 lb.	14 lb.	41 lb.
Gross			16 lb.	45 lb.

This vise is accurately machined on the bottom, sides and end, for use in holding work in several positions on drill press, shaper, etc., allowing it to pass through several operations before necessary to change it in the vise. An entirely distinct feature in vises and one that is quickly appreciated by Tool Makers, Pattern Makers and Machinists. Your jobber can supply.

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The Simple Smooth Strong Flat Crimp Cut-Off

Made in Plain Round Corrugated Round and Square

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Galvanized After Formed

Made also in Copperoid Metal and Cold Rolled Copper

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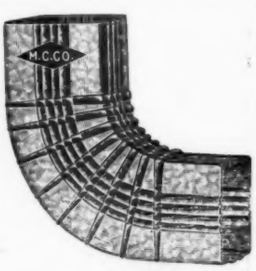
A very smooth and well fitting elbow

Corrugated and Plain Round and Square



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30, 45, 60, 75 and 90 Degrees

Made in Standard 26 and 24 Gauge